30488/B/2
L. LXIII
19/8

WN & HEWITT
ookbinders,

30488/B/2

HYDROPATHY.

47429

HYDROPATHY.

THE

THEORY, PRINCIPLES, AND PRACTICE

OF THE

WATER CURE

SHEWN TO BE

IN ACCORDANCE WITH MEDICAL SCIENCE AND THE TEACHINGS OF COMMON SENSE;

Illustrated with many Important Cases.

BY EDWARD JOHNSON, M. D.,

Author of "Life, Health, and Disease."

WITH NINE ENGRAVINGS.

Second Thousand.

LONDON:

SIMPKIN, MARSHALL, AND CO. IPSWICH: BURTON.

MDCCCXLIII.



IPSWICH:
PRINTED BY J. M. BURTON,
TAVERN STREET.

PREFACE.

About five years ago I published a treatise, entitled "Life, Health, and Disease." I little thought, while writing that treatise, that there was a primitive philosopher, in the person of Priessnitz, who was, at that very moment, actively engaged in *reducing to practice* all the great *principles* laid down by me in that very treatise, and demonstrating the truth of my views by a degree of success unparallelled in the history of disease and its treatment.* In the November of last year, (1842) that work fell into the hands of Captain Claridge, to whom England is indebted for the introduction of the water cure into this country.

Observing that the opinions and arguments therein contained are highly favourable to the hydropathic treatment of disease, and in strict

* I strongly recommend all those who feel interested in the subject of hydropathy, and would become thoroughly conversant with all its leading principles, to read "Life, Health, and Disease," to which this work may be considered as a practical sequel.

and curious accordance with all the leading principles of the Græfenberg method of cure—and being struck with the remarkable fact that these opinions of mine (deduced from general reasoning on the nature of animal life, and the causes of disease) were conceived and published by me some years before the water cure had ever been heard of in England—Captain Claridge did me the honor to call on me.

The result of that interview was that I immediately started for Græfenberg, where Priessnitz, the founder of the water cure, has his establishment—and the present work was written on the spot.

The object of my journey, however, was not merely to collect cases ; that having already been done by others. But it was, first, to determine whether the reports in circulation, concerning the great success of the treatment, were founded on fact—secondly, to ascertain the effects of that treatment, not only on the patients of Priessnitz, but on my own person, and on the persons of three other gentlemen (patients of mine) who, having determined on a continental tour somewhere or other, were kind enough to accompany me to Græfenberg, for that purpose. Thirdly,

having watched the effects produced on myself and friends—having, moreover, examined with my own eyes whatever cases Priessnitz might then have under treatment (of which I found more than two hundred)—having ascertained the nature of their several diseases by personal inspection—and having watched the effect of the treatment upon those diseases (for which purpose I remained the whole of the winter)—having made myself thoroughly acquainted with all the different modes of applying the remedy adopted by Priessnitz in the various diseases under his care—my further object *then* was to see how far it was possible to *reduce the practice to principle* —to ascertain whether the practice could be reconciled with those facts which modern science has revealed, and with the opinions which scientific men of the present day entertain with regard to the nature of living beings, and the nature and causes of disease in general. And, in attempting this, it will be observed that I have not referred to second-rate and obscure writers, nor have I raked up from oblivion the crude opinions of a byegone age, but I have selected the most celebrated and the most modern—Liebig and Billing. In a word, my principal object was, not so much

to multiply reports and reiterate facts—*but to give reasons;* and the result of my observations will be found in the following pages.

But whether I have succeeded or *not* in this task of reconciling practice with principle, still THERE STAND THE FACTS. And whether the views of Liebig and Billing be right or wrong, still the *facts—the actual cases of cure* by the hydropathic treatment—still remain *untouched and untouchable.* The intrinsic value of theory may be but small. But *whatever* its value may be, it is clearly *as great* in the case of hydropathy, as in that of the old practice; and, with regard to the modus operandi of drugs, no more is known (independently of theory) than is known with regard to the modus operandi of water. For no man can tell the *why or the wherefore* that quina cures the ague, that the nitrate of silver occasionally cures epilepsy, or that mercury arrests the diseases for which it is administered. No man can tell why jalap empties the bowels, why antimony empties the stomach, or why acetate of ammonia increases the secretion of the kidneys.

All I have pretended to do is to show that the practice of hydropathy can be as easily reconciled with the existing theories of life, health, and dis-

ease, as the practice of *medicine* can—and this, I conceive, is all that can possibly be required of me. But I will be bold enough to add, that nothing can be more easy than to show that the practice of medicine is perpetually seen, running full tilt, in the very teeth of its own fundamental principles—which hydropathy is *not*.

De facto, both the old practice and the new must rest *substantially* on the facts of experience —and on these facts alone—and these, in favor of hydropathy, are sufficiently numerous, and are daily and hourly increasing *in this country*, and have been so increasing in *other countries*, for the last *twenty years*—but, unfortunately for suffering humanity, the peculiar circumstances under which the practice was originated precluded the possibility of their being recorded and made known to the public, until within a very short period from the present time. But, I repeat, putting experience out of the question, in both practices, as much can be proved theoretically in favor of the practice of hydropathy, as of that of medicine.

It is in vain, therefore, to say that Liebig's, and all other theories, may be *wrong*. For, if they be wrong at all, they must be equally wrong

for the practice of *medicine,* as for that of hydropathy. If hydropathy can *found nothing* upon theory—so *neither* can the practice of medicine.

But though the collection of cases did not constitute my chief object, I have nevertheless introduced a few remarkable ones, most of which fell under my own immediate notice; and although I have not, in every instance, been permitted to give the names of the patients, yet they have all allowed me, if any doubt arise as to the authenticity of their reported cases, to give their names and addresses on *personal* application made to me for that purpose.

The term *hydropathy* is not well chosen, and has become the object of much *sneering* on the part of those who can find no more substantial objection against the water-cure. It is, however, perfectly *understood*—and there are many hundreds of words in daily use whose *etymological sense* is as far removed from their *conventional meaning* as in the case of the word *hydropathy.* I have, however, occasionally substituted the word *hydrotherapeutics,* in the hope that the public ear may become accustomed to the use of that word which is certainly a more proper one. Therapeutics signifies the science of healing, and *hydro*-thera-

peutics, that is, *water*-therapeutics, may very properly be applied to designate the science of treating diseases by *water*.

The *oneness* of the remedy is an objection which will probably occur to most persons. But the slightest reflection will show that this objection is not a whit more applicable to hydropathy than it is to drugs. We have hundreds of drugs, it is true; but how many of these are only so many *different* means of producing the *same* effects—because there is not *one* of them which can be relied on. Thus we have *scores* of different drugs for producing the *one* effect of opening the bowels. If we had *one* drug which could be relied on for accomplishing this object, it is clear that we should want no other. The same may be said of narcotics and tonics. Dr. Billing has already reduced all drugs to no more than *four*—stimulants, narcotics, sedatives, and tonics. But, at the same time, he has shown that even *these four* are only four *different* means of effecting *one* object—constringing the capillaries. To use Dr. Billing's own metaphor, the *different* drugs are but so many *different* hobbies which carry their *different* masters to the *same* point.

And again, different *intermediate* effects are pro-

duced by the different modes and doses in which *one and the same* remedy is administered.

In how many opposite diseases are mercury and arsenic daily exhibited! Five grains of calomel divided into ten doses, and one dose administered three times a day, will generally produces *alivation* and not purge the bowels. But the whole five grains given at once to the same person will generally purge the bowels and *not salivate*. A quarter of a grain of opium will frequently keep a patient *awake* half the night, while a whole grain will keep him *asleep* the whole night. A quarter of a grain of tartar-emetic will purge the *skin;* half a grain will purge the bowels and *not* the skin; one grain will generally produce sickness of stomach; and two grains will empty the stomach and purge the bowels, *both*.

Minute doses of arsenic will cure the ague; a little larger doses will inflame the eyelids; larger still will inflame the stomach, and kill the patient. Arsenic will cure both intermittent *fever*, and also some chronic diseases of the skin in which there is *no* fever, nor any constitutional derangement of any kind.

All efficacy *entirely* depends, both in physic and hydropathy, upon the *manner* and the *dose* in which the remedy is exhibited.

With regard to the danger supposed to attend this remedy, nothing on earth can be more purely chimerical, supposing always that it is practised by competent persons, who understand both the nature of the animal machine, the nature and seat of the various diseases to which it is liable, and the nature of the effects which the treatment produces. Surely the administration and external application of mere clean water cannot possibly involve more danger than the application of the lancet, the drawing out of the body portions of that vital fluid on which life itself depends, and the internal administration of such deadly poisons as arsenic, mercury, prussic acid, lead, copper, lunar caustic, aqua fortis, oil of vitriol, iodine, opium, &c. &c.—all medicines in daily and hourly use throughout the kingdom.

In conclusion, I have only to say that I have practised my profession for more than twenty years—that, in conformity with the advice given me by the late lamented Sir Astley Cooper, one of whose pupils I had the honor to be for four years, I began life by attending to the cases of as many poor persons as chose to consult me, without any charge—that I continued this practice for ten years—that, in consequence of this practice,

it has frequently occurred to me to write as many as twenty thousand prescriptions in a single year. I only mention this circumstance, however, to show that I have not been entirely without professional experience—and for the purpose of giving more weight to this my declaration, viz., *that I am perfectly convinced that I can cure a greater number of diseases, and in a shorter time, by the hydropathic treatment, than I can by the exhibition of drugs—and that there are many diseases which I can thus cure which are wholly incurable by any other known means.*

The great, and, as I believe, the only objection to the hydropathic treatment is, that it costs a good deal of both time and trouble. It is, therefore, in a country like this, where time is money, a very *expensive* treatment. On this account, it is never likely to become the treatment first resorted to, at the onset of disease. Its legitimate sphere of action therefore is, and must remain, amongst those diseases which have *already resisted* the ordinary treatment, as a *dernier resort*—and amongst those other disorders over which it is *allowed* that medicine possesses scarcely any control—such as chronic gout, chronic rheumatism, nervous disease, indigestion,

scrofula, painful affections of the nerves, general debility, (and local disease depending upon it) leucorrhœa, skin diseases, and multitudes of anomalous affections to which medical nomenclature can give no particular denomination—in a word, all depraved conditions of the general health, all functional derangement, all deficiencies of action in any one of the vital organs—for which no specific cause can be assigned.

I, for one, am quite willing to confine my practice to this class of diseases—and any patient of mine (who may desire to do so) shall be at liberty, as often as he pleases, to consult his ordinary medical attendant, in conjunction with myself; since I am not only willing, but desirous to act *with* the profession, and *not* against. Having no mystery to be exposed, and no secret to be concealed, and satisfied that the hydrotherapeutic treatment can never bestow on the public all the benefit of which it is capable until it shall have been examined and acknowledged by the profession at large, (for it is through them that it must come to the public), I am anxious to practise it under the eye of that profession, in order that medical men may have a fair opportunity of ascertaining in what diseases it is useful,

and in what not so: to the end that society may be enabled to derive from it, as soon as possible, *all* its advantages, be that *all* little or much. This seems to me to be the fair, proper, and honorable mode of proceeding, both as it regards the public, the profession, the treatment, and myself.

I am quite satisfied that a body of honorable and educated men, such as none can deny the medical profession of England to be, can have no other motive for repudiating this mode of treating disease, saving a conscientious belief either in its inefficiency or danger; and that they only wait to be satisfied of its value in order to give it an honorable place among the varied means of alleviating human suffering.

But in order to enable them to *judge*, it is quite clear that they must have a fair opportunity of *seeing it practised*—and this opportunity I shall be at all times most willing to give them.

By pursuing this method, the true amount of the value of the treatment in question cannot fail of being soon ascertained. If that value shall prove to be great, the medical profession, I am sure, will be quite ready to acknowledge the fact; and the public, deriving confidence from that

acknowledgment, will at once be put in possession of all the advantages to be obtained from a new and most important remedial agent. If, on the contrary, its value should turn out to be little or none, then the public faith will be disabused of an error, and the public pocket protected from a useless expense; and the profession will be spared the imputation of having rejected the treatment *without examination,* and the conclusion (which many will be ready enough to draw) that they did so from selfish and interested motives.

I cannot conceive why medical men should refuse to give this treatment a trial, unless it be from the *unprofessional* manner in which it was introduced, and by an *unprofessional* man. But surely this is a most insufficient reason! If Captain Claridge, in his travels, had met with some Austrian old woman who was in the habit of administering some *particular pill* to fifteen hundred patients every year—if he had *observed* that, out of this vast number, a great many were cured of several diseases, otherwise considered as incurable—if he had *observed* that the drug, when administered in *one* dose, produced profuse perspiration, but when administered in *another* dose, had the effect of *lowering* the temperature and

reducing the frequency of the pulse in the most remarkable manner—if he had analysed the old woman's pill, and found that it contained the *active principle* of some common weed, hitherto unnoticed—if he had come to England and published all the remarkable cures which he had himself actually *seen* performed by the active principle of this weed—*is there a single medical practitioner throughout the entire kingdom who would not immediately have given this drug a careful and cautious trial?* No—not one—not one. Then why refuse to give that trial to the remedy of the peasant of Græfenberg, which would not have been refused to the *pill* of the old woman of Austria?

There is no well-educated medical man in England who dare, for his reputation's sake, refuse to admit that a remedy which can produce (at will) the most profuse perspiration, and which can (also at will) lower the temperature and the velocity of the heart's action to any given degree (even to the extinction of life)—I say there is no well-educated medical man who dare deny that such a remedy *must* possess an immense power over diseases of all kinds.

18, *New Burlington Street, London.*

CONTENTS.

PART I.

FACTS; OR CASES OF CURE.

	PAGE
The Novelty of the Water Cure no valid objection	4
Two cases successfully treated by the author more than twenty years ago	5
GRÆFENBERG CASES:—	
Paralysis—3 cases	9
Sciatica	14
Sciatica with Lumbago	16
Constipation—2 cases	17
Dyspepsia	18
Dyspepsia and Rheumatism	21
Gout and Rheumatism, complicated with Venereal Taint	25
Gout in the Hands and Knees	26
Rheumatism with Psoriasis—2 cases	27
Skin Diseases—Psoriasis—2 cases	32
Fistula in Ano	36
Urinary Fistula	38
Gonorrhœa	39
Lung-disease—2 cases	41
Deafness—3 cases	48, 49, 73
Hip Disease	50
Scarlet Fever	52

Symptomatic Fever . . 53
Catarrh, or Cold . . . 56
Baldness . . . 57
Head-ache with Giddiness . . 58
Secondary Symptoms—4 cases . 60
Impuissance, complicated with Gout . 66
Contracted Joints . . . 67
Hernia 67
Hæmaturia 68
Cerebro-Spinal Disease . . 68
Suppressed Measles . . 70
Ague 72
Hypochondriasis, Psoriasis, and Sciatica 75

PART II.

SCIENCE; WHEREIN HYDROPATHY IS SHEWN TO BE SUPPORTED BY LIEBIG'S THEORY OF LIFE.

CHAPTER I.—Oxygen the Element of Destruction—Nature of Animal Life—before and after Birth 80 to 96

CHAPTER II.—Universal Equality of the Temperature of the Human Blood—Means by which Animal Heat and Weight are maintained unchanged—Circle of Circulation—Digestion—Vital Affinity—Transformation of Matter—Three Conditions of the Elements of Food in the System—Importance of Oxygen in all that concerns Life, Health, and Disease—introduced principally by Respiration—Influence of Cold in Accelerating the Transformation of the Tissues—illustration of the Græfenberg mode of treatment—Recapitulation . . 97 to 159

CHAPTER III.—Health—Disease . 106 to 168

CHAPTER IV.—Liebig and Priessnitz—Of the partial application of Cold Water—Difference between the ordinary Practitioner and the Hydropathist—The new remedy of the latter not applicable to *all* Diseases, nor to all states of the same Disease—not unique and one, but several—Various modes of the application of Water, the Leintuch, the Umschlag, the Abreibung, the Vannah, the Douche—Internal use of Cold Water—Sweating Process—Adjuncts to the Water Cure—Exercise—Entire Abstinence from Alcoholic Drinks—Diet . 169 to 206

CHAPTER V.—The Crisis—The Humoral Pathology 207 to 221

CHAPTER VI.—Diseased Conditions of the Body to which the Water Cure is more especially adapted—Acute Diseases—Neuralgic or Painful Diseases—Indigestion—Leucorrhœa, or Fluor Albus—Epileptic Fits—Gout and Rheumatism—Spinal Irritation—Difficult Menstruation—Influenza 222 to 233

PART III.

SCIENCE; WHEREIN HYDROPATHY IS SHOWN TO BE SUPPORTED BY DR. BILLING'S THEORY OF DISEASE.

Character of Dr. Billing's Work—His Theory—Inflammation—Way in which Medicines operate—Sedatives, Tonics, Narcotics, and Stimulants—Manner in which Dr. Billing's Theory supports, justifies and recommends the Hydropathic Treatment—Its Comparative Safety over the administration of Drugs—Diversity of opinion among eminent Medical Men respecting the operation of Drugs—Apprehension of danger from going into the Cold Bath, when covered with perspiration, perfectly chimerical 234 to 271

PART IV.

COMMON SENSE: ARGUMENTS INTELLIGIBLE TO ALL CLASSES OF READERS.

CHAPTER I.—Diseases the result of our Artificial Habits —The Curative Power—Diseases must be cured by its operation—The Causes of Disease should be removed—Remedies merely employed for placing the body under the most favourable circumstances for resisting Disease—The Hydrotherapeutic Treatment an imitation of the primitive condition of Man —Amount of Disease proportioned to the amount of Polish and Cultivation—Agricultural Laborers continually undergoing the Water Cure 272 to 287

CHAPTER II.—Hydropathy no empirical or unintelligible Imposture—In Man's primitive state, the causes of Disease are chiefly limited to Mechanical Accidents, and the Influences of Soil and Climate—Domestication of Animals augment their ailments—What Hydropathy achieves for its votaries—Every living thing has a fixed position—Mechanism and Organism synonymous . . 288 to 304

CHAPTER III.—Diet at Græfenberg—Compulsory Absorption the effect of a rigorous Diet—Quality of Water —Authenticity of Reports regarding the Cures performed at Græfenberg . 305 to 315

HYDROPATHIC LACONICS . 316 to 328

REFERENCES TO THE DIAGRAMS.

	PAGE
No. 1.—Circle of Circulation . . .	103
No. 2.—Oxygen and Hydrogen united to form Water	108
No. 3.—An atom of Water decomposed .	109
No. 4.—Again combined by the Electric Spark	109
No. 5.—Lime and Muriatic Acid transformed when mixed in Water . .	110
No. 6.—Illustration of the change of Matter in the Animal System . . .	113
No. 7.—Reception of Oxygen by the Lungs .	127
No. 8.—Equilibrium of Respiration and Circulation	189
No. 9.—Elements constituting Alcohol . .	198

HYDROPATHY.

Contrary to the usual practice, I shall commence this work by a *relation of facts*—by a detail, namely, of cases treated by cold water, *under my own eye,* by Priessnitz at Græfenberg.

Most of these cases fell under my own immediate notice, and were examined by me *personally,* and their previous history and progress narrated to me by the *patients themselves.* There are two or three, however, for the history of which I am indebted to George Anthony, Esq., an English surgeon who has been residing in Priessnitz's establishment for a considerable time, and who took notes of such cases as fell under his notice.

It may be as well to observe here, that this gentleman has quitted his profession for a very lucrative appointment in the East, to which he proceeds in the latter part of this summer—that he went to Græfenberg merely as matter of curi-

osity, and to fill up his time previously to his quitting Europe—and that the cases noted by him cannot therefore be supposed to be *coloured favourably* by any interested bias towards hydropathy; against which indeed he evidently entertained at first a very natural and professional prejudice.

For two other cases I am indebted to Colonel Bowen, late of the Coldstream Guards; but the great bulk of them fell under my own immediate notice, and personal examination.

I have preferred the plan of stating *my facts*—that is, *my cases*—at the *outset* of the work; because the sole object of all the rest of the book is to reconcile these *observed facts* with the existing state of physiological and pathological knowledge; and to show that these *observed facts* are not in opposition to anything which science has taught us with regard to the laws of the animal economy, the nature of disease, or the mode of operation of remedial agents; but that, on the contrary, they are in strict harmony with the views entertained by some of the most modern and *confessedly* most scientific men of the present day, with regard to the nature of living beings; and that they are *precisely such facts* as the

present state of physiological and pathological knowledge would lead the scientific reasoner *to expect to meet with.* And as some proof of this, I may add here, that the great general principles whereon the hydropathic treatment rests its claim to confidence, were promulgated by me in a work which I published, some three years before this treatment had ever been heard of in England, either by myself or anybody else. That work is well known to the public, under the title of "Life, Health, and Disease."

If I had first invented a theory, and then sought to support that theory by *the relation of* facts, these facts would have been most properly placed *after the theory had been expounded*—that is, at the end of the book. But I have proceeded in an exactly contrary manner. I have first *observed certain facts*—and then merely sought to account for these *previously* observed facts on scientific principles; and to show that there is nothing extraordinary in the *nature* of these facts, or in any way calculated to make them difficult of belief. In a word, to show that scientific knowledge is entirely in favor of them; and that there is nothing opposed to them but scientific ignorance, vulgar prejudice, and a long course of

customary modes of thinking; for which modes of thinking *no reason can be rendered,* excepting that they are—*customary.*

They add only one more to the *ten thousand instances, already on record,* of old errors suddenly and accidentally dispelled, and new truths as suddenly and accidentally discovered. *Like the ten thousand instances already on record* also, they are violently opposed by the multitude. *Like the ten thousand instances already on record* also, they are met by the jeers and small witticisms of the *thoughtless* and *unreasoning,* who have no better standard, wherewith to measure the claims of any new proposition, than that of common *custom*—and they are at once *confidently* repudiated by those who think it a great mark of cleverness, of quick penetration, and shrewd judgment, to pronounce a bold and sweeping opinion, *without the labour of either thinking or investigating,* as who should say: "these novelties may impose upon many, but they cannot impose upon ME." In all this, the hydropathic philosophy only shares the same fate as that of Brindley's plan for conducting water through the Bridgewater canals, the application of steam to navigation, the scheme for lighting our streets without

either oil or tallow, &c., &c. All these were ridiculed sans cesse, when they were first proposed, and formed the subject of countless caricatures. The witlings are dead and forgotten —but the Bridgewater canals, steam-boats, and gas-lights still exist, giving hourly proof of the truth of that scripture apophthegm which declares that "*a fool is wiser in his own conceit than seven men that can render a reason.*"

From this arrangement, therefore—facts first, and theory afterwards—and the observation just made concerning that arrangement—it will be perceived that it will *not be sufficient* to throw discredit on the theory. In order to constitute a substantial and valid objection, discredit must be thrown upon the *facts themselves;* either by proving them impossible, according to the nature of things, or, by showing that they are fatally opposed to some *better and more truth-like theory than that of Liebig.*

Before I proceed to the detail of cases treated at Græfenberg, I will mention two remarkable ones which I treated myself by cold water alone, more than twenty years ago—that is, before its efficacy as a remedial agent was known *even to Priessnitz himself.* I mention these, merely to

show how early in life I had been led, by observation and general reasoning, to form a high opinion of cold, in the treatment of disease.

Somewhat more than twenty years ago I became the subject of a very uncommonly severe attack of acute rheumatic fever. I was attended by Dr. Birkbeck and Dr. Thomas Davies, who afterwards became physician to the London Hospital. I was also daily visited by some other medical gentlemen living in my neighbourhood. They were exceedingly kind and attentive to me, for which I shall never cease to feel most grateful—and I am quite certain that my case was treated in the most scientific manner, that is, according to the accepted medical science of that day.

I was three times bled in the arm, and took frequently repeated doses of calchicum, which produced excessive and continued vomiting. These powerful means, however, failed to remove the pain, but reduced me to so low a degree of exhaustion, that the fever began to assume the typhoid or nervous character. My wife was now told not to calculate upon my recovery, and ordered to give me brandy, repeatedly and at short intervals, during the course of the night. At this

time my skin was excessively hot, and the bed clothes oppressive. I begged and prayed for cold water to drink, and to have myself washed all over in cold water. Everything that was delicious and desirable in the universe seemed to be represented by those two words—cold water. My wife at last yielded to my entreaties—and the more so, inasmuch as she had often heard me enlarge upon the efficacy of cold ablution in fevers and many other diseases, and lament that popular prejudice would not suffer me to employ it so frequently as I desired. She had moreover herself, on one occasion, been plucked from agony and sudden danger by the use of snow.

The cold ablution, and large draughts of cold water, were immediately exhibited, and industriously and frequently repeated night and day.

In a week, with the exception of the debility consequent on the loss of so much blood, *I was quite well.*

The second case occurred in the person of my wife about a year previously to that which I have just mentioned. On the evening of the third day after her first accouchment, I came home from Guy's Hospital, where I had been detained since morning, and found her groaning and weeping

with intense pain, the breasts red, and enormously enlarged, which the frightened nurse was vehemently rubbing with brandy and oil. The skin was excessively hot and dry, and the pulse was leaping along at the rate of 120. It was in the month of January—so I walked into the street with a pail, which I filled with snow, and bringing it into the sick room, I piled a heap of it over both breasts, continually adding fresh snow as it melted. In a very few minutes the milk span out in streams, to the distance of more than a foot, and the tears of torture were at once changed for those of pleasure, accompanied by that hysterical sobbing, which is the common result of a sudden transition from intense suffering to perfect ease. The mere absence of pain in these cases takes all the characters of the most delicious and positive pleasurable sensations. In half-an-hour the inflammation had subsided, the breasts had become *comparatively* flaccid, the fever had entirely subsided, and not only all danger, but all inconvenience, had utterly vanished. But for this timely succour, suppuration must have supervened in both breasts, and large abscesses would have been the *inevitable consequence*.

GRÆFENBERG CASES.

PARALYSIS.

HERR VON WULFFEN'S CASE.

This gentleman, an officer in the Prussian army, was seized in 1842 with a paralytic stroke. Of this he recovered. But the disease continued to recur at short intervals, until he had almost entirely lost the use of one side of the body—so that he could only walk very imperfectly and with great difficulty. In addition to this, he was extremely rheumatic, and the glands of the neck were swollen. After resorting to an infinite variety of curative means, which left him exactly where they found him, he came to Græfenberg.

After his arrival at Græfenberg, and commencement of the treatment, this gentleman did not experience a single attack for two months, although before his arrival he would frequently be attacked two or three times in a month. The swelling of the glands of the neck subsided, his

rheumatism was entirely removed, and his health completely re-established.

At the expiration of two months, however, he one day took an extremely long walk among the mountains, and came home very much fatigued, cold, and with wet feet. And now, instead of going to bed, he went into the hot and crowded billiard room, where he continued to play for some time. After this he suddenly lost the power of distinct utterance, could with difficulty articulate his words, and began to talk, all at once, quite incoherently. Priessnitz was sent for, who threw cold water over his face and chest, and then ordered him a foot bath, with three men to rub his feet, for half an hour. This recovered him. He was then told to walk, but after having walked for ten minutes he became so weak that he was obliged to go to bed. His friends now left him in order to go to dinner. When they returned they found him quite in his senses, but perfectly speechless, and unable to write. In fact his tongue and right hand and foot were palsied. Priessnitz now ordered him a wet sheet (merely damp) for ten minutes—then another, a little wetter, for ten minutes more—and then a third, very wet indeed, for ten minutes more again.

Feverish symptoms now followed, with violent headache, and great prostration of strength. For these symptoms he was put into the tepid bath for half an hour, and well rubbed by three men the whole time. Vomiting now took place, and in the evening he was up in the saloon at supper as well and as sensible as any one there; and laughingly assuring his friends that he was now not only in full possession of his tongue, but of his teeth too. Since this time, which is now some months ago, he has had no return, has the perfect use of all his limbs, and is otherwise in good health.

HERR REGENHARD'S CASE, OF VIENNA.

Herr Regenhard, of Vienna, had suffered for many years from nervous disease and severe dyspepsia. Three years since he had a paralytic seizure of the right half of the body—not severe—and from which he recovered. Six months afterwards he had a second attack—more severe—from which, however, he partially recovered. Four months later he had a third attack, and afterwards a fourth and fifth, the intervals between the fits becoming shorter and shorter, until they returned every fortnight. His right leg and arm

now became nearly useless. He was advised to try the baths at Töplitz, which he did, but without any good result. He returned to Vienna; he took the best advice which that capital could afford, but entirely without benefit. One of his physicians at last, with a candour and honesty which do him honor, confessed that he believed his case to be beyond the reach of any ordinary medical treatment, and recommended him to try the water cure. He came to Græfenberg in company with my friend Mr. Niemann, who was also going to Græfenberg on his own account. He arrived there in May, and was then in his sixtieth year. He was immediately put under a very mild treatment (merely an abreibung, rubbing the head with a wet cloth, and a coph bath). In six weeks he had crises, but (which is very remarkable) only on the side affected. Not a single pimple appeared on the sound side. When the crises appeared he took leintuchs with abgeschrecktes bath. No cold bath, no douche, no sitz bath. He continued to have crises till October (five months). He then left perfectly recovered, never having had a single attack after he commenced the treatment. His friends at Græfenberg have since received two letters from him, perfectly well written by that

same right hand which was paralysed and useless when he first came to Græfenberg, and which had been to him nearly a profitless member for the three previous years.

In gratitude for his recovery he has made several ornamental presents to the grounds about Græfenberg, which still remain, and will remain there, monuments of the curative power of cold water. Indeed Græfenberg abounds with such monuments, both in iron and stone, erected by Gratitude in commemoration of recovered health, and of a size and durability which gives them a fair chance of endurance for hundreds of years.

CAPTAIN WARDLE'S CASE.

Captain Wardle, of the Fiquelmont dragoons, the nephew of Colonel Wardle, celebrated for certain charges which he preferred against the Duke of York, became suddenly deprived of the use of one entire side. He was blind of one eye, deaf of one ear, and the leg and arm of one side were paralysed. He was twenty-two years of age. Under the water cure he entirely recovered. The sight of the eye was perfectly restored, his hearing entirely regained, and the full use of his limbs returned. After his recovery,

Colonel Bowen saw him, on guard at the theatre of Prague, the picture of youthful health and manly strength. He is still on military duty at Prague.

SCIATICA.

Mr. Wängler, merchant, had been affected with sciatica for eighteen months. He was living at Milan, and the physicians there recommended him to have the actual cautery* applied to the part. This, however, he refused. He then went to a water establishment in the Tyrol, superintended by a physician, but one who was grossly ignorant of the principles on which the water cure proceeds. This gentleman succeeded at last in persuading him to submit to the actual cautery, for his sufferings were so great that he would have submitted to almost anything in the hope of relief. He showed me the deep scar left by the hot iron, and which was as large as my extended hand. From the actual cautery, however, he received no benefit, and, in consequence of injudicious treatment, he became exceedingly ill, and then proceeded to Vienna, where he placed himself under the most celebrated medical prac-

* The actual cautery is a hot iron.

titioners, and underwent every conceivable mode of treatment. While submitting to treatment at Vienna, his bowels suddenly became constipated, and would never relieve themselves without the aid of medicine; and his thigh dwindled away until it was but little larger than his wrist; and he could not walk a single step.

He was now brought to Græfenberg, where he has resided for the last nine months. He gave me the history of his case himself, and was good enough to let me examine the affected parts. He is now perfectly well, perfectly free from pain, full of flesh and animal spirits, and the withered thigh has entirely recovered its original very fleshy dimensions. He is not in the slightest degree lame, and can climb the mountains with the best of them, and in any weather. He is covered with the usual critical eruption, as soon as which subsides he will return to his family at Milan. He is forty-eight years of age. His treatment consisted of the leintuch, succeeded by the tepid bath, the sitz bath, and douche.

SCIATICA WITH LUMBAGO.

MONSIEUR VARNOD'S CASE.

This gentleman was afflicted with sciatica for *three years* so severely that it was with great difficulty he could walk even with the aid of a stick. Every ordinary means of cure had been resorted to without effect. He was at last prevailed upon to visit a water establishment at Innspruck. With great pain and difficulty he was got down to the side of the cold bath; and here it required a great exertion of courage in a lame man, and one who could not on any sudden emergency move his limbs without excruciating pain—I quite agree with him, that it required great courage in one so situated to allow himself to be tumbled heels over head into the water. With fear and trembling, however, he submitted, and to his utter astonishment found that while in the water he could move his limb without the slightest pain or inconvenience. The pain had entirely vanished, and from that moment to this it has never returned, nor does he exhibit the slightest indication of lameness or weakness in either of his legs. He is now at Græfenberg for another disease—a disease of the skin.

CONSTIPATION.

Herr Fricks, the father of the young man whose case I am about to relate, put himself under treatment also, for an obstinate constipation which had annoyed him, and interfered greatly with his health, for 17 years. So obstinate and torpid had the bowels become, that it would frequently require four or five lavements before their contents could be emptied.

This gentleman was treated by leintuchs and sitz baths—four of the former daily, (two in the morning, and two in the evening, each couple of leintuchs being succeeded by the tepid bath) and two of the latter also daily.

In a fortnight this gentleman's bowels began to empty themselves, without any assistance, daily and plenteously, and have continued to do so up to the time when I left Græfenberg.

MR. NIEMANN'S CASE.

Mr. Niemann, a gentleman about 35 years of age, was affected by obstinate constipation. During five entire years he never once was able to pass a motion, without the aid either of medicine or an injection. He is now at Græfenberg,

and for the last four months has had a regular and healthy evacuation every day, without the use either of injection, or of a single grain of medicine of any kind whatever. Had not this gentleman's constipated condition of bowels been thus fortunately removed, I feel quite sure that every unprejudiced medical man will allow that, sooner or later, severe disease, in some shape or other, must have been perfectly inevitable.

This gentleman had no crisis.

DYSPEPSIA.

Mr. —, 48 years of age, had been accustomed for many years to indulge in a very free mode of living. His daily regular allowance of wine was one full bottle, in addition to sundry glasses of ale, and a couple of glasses of brandy and water in the evening. This was his regular daily quantity. Under this excitement his health soon began to suffer, and it grew gradually worse, until, about twelve months since, he was in so shattered a condition, that he found it necessary to adopt some rigorous and continued means to repair the mischief his constitution had sustained. The symptoms of which he complained were, excessive languor, physical weakness,

drowsiness, and depression of spirits, foul tongue, relaxed throat, (to such an extent that he was obliged to have his uvula removed by the surgeon's knife,) capricious appetite, and all that long train of the most distressing symptoms which characterize a severe case of dyspepsia, accompanied by hypocondriasis. He had been affected, too, for many years, with large furunculi, or boils, of such severe and irritable character, that when one appeared on the chin, it would cause the whole of one side of the face to swell so violently as to entirely close the eye of that side. For these furunculi he consulted a London physician, who ordered him to take a pill every day before dinner, consisting of aloes, rhubarb, and extract of camomile. These pills stopped the appearance of the furunculi, and from that moment all his distressing symptoms became aggravated.

After very many fruitless efforts to regain his health, he repaired to Græfenberg. At this time he was so weak that he could not walk the length of a single street. At Dresden, which is a small city, in attempting to walk from one exhibition to another, he found himself unable to do so, and obliged to dispatch his servant for a coach while he waited for its arrival. His breath, moreover,

was so short that he could not maintain a conversation for more than five minutes together. In six weeks after his arrival at Græfenberg he could sing; and his strength is now so great, that he walks up and down the snow-clad mountains, often as early as six o'clock in the morning, without any difficulty, in all kinds of weather, and he declared to me that he believed himself able to run continuously, at a moderate pace, for a distance of three or four miles without stopping. Every day I see him climbing the hill-side in large jack-boots, breasting the acclivity with the firm and vigorous step of perfect health and strength. This gentleman bathes, and douches, and takes one or two wet sheets every day, wears umschlags round the body, and drinks nothing but pure cold water. Yet this gentleman had been all his life accustomed to luxurious living, and the daily use of wine and spirits. He declares that when he came to Græfenberg he did not know even the taste of water—for when he cleaned his teeth in the morning, he always took great care to expel every drop of water with the tip of his tongue, fancying that if he suffered it to enter the cavity of his mouth, it could not fail of producing some deadly mischief; and he would

as soon have thought of swallowing poison, as of drinking a cup of cold water. And this gentleman did not leave off the use of stimulants gradually—he left them off entirely at once—and so far from experiencing any evil consequences, he immediately became sensible of relief.

I will just mention that this gentleman had for a great many years (perhaps 20) a large fatty tumour on his back—so large as to be quite visible through all his clothes, and giving to him an appearance of deformity. When I examined this tumour a few days ago it had almost entirely disappeared.

DYSPEPSIA AND RHEUMATISM.

HERR BAUMANN'S CASE.

Herr Baumann, a builder, from Saxe Wiemar, 45 years of age, suffering under rheumatism, dyspepsia, nervous debility, and with a constitution, to all appearance, quite broken. The first crisis made its appearance in the form of the usual eruption, and he felt himself relieved. Some time after this, however, he had another crisis, consisting of what are called furunculi, or boils. He now began to mend rapidly. His dyspeptic symptoms left him, his rheumatic pains

ceased, his nervous debility gradually vanished, and his health is now firm, strong, and good.

Mr. J. B. S—, a gentleman of Manchester, came to Græfenberg in June last. I had the history of his case from his own mouth. His case was one of confirmed and obstinate dyspepsia of four years' standing. Being a man of property he took the advice of the most eminent physicians' who, having failed in relieving him, finally recommended him to travel into a warmer climate. In obedience to this advice he went to Rome. Here he improved a little for a short time, and then became again as ill as he was when he set out.

While travelling on the continent he accidentally made the acquaintance of a Captain Fuminelli, of Venice, to whom he related his case, and the object of his travel—a search after health. The captain, now the strongest man in Venice, and who had himself been raised from a sickly condition to one of high health, by the sole use of cold water, at once strongly recommended him to repair to Græfenberg, and he came accordingly. When he arrived his symptoms were these—first, great general physical debility, so that he could not walk even a small distance without great fatigue

and exhaustion. He was the subject of constant heartburn—his tongue exceedingly foul—his appetite capricious—and his stools invariably presented the appearance of little, hard, stony balls. He was perpetually annoyed by *sighing and gaping*, which he could not resist even when engaged in conversation—proofs of great vital debility. In addition to all this he had a constant and severe pain in his left side.

This was his condition for four years. These were the symptoms which had obstinately resisted the most judicious medical treatment under the ablest medical advice in England. The first sensible effects of the treatment were manifested in the changed appearance of the alvine evacuations. These became large, hard, dry, and solid, and their expulsion exceedingly painful. For this he was ordered a wet bandage round the body, covering the whole abdomen and stomach. In two days his motions assumed a perfectly natural and healthy appearance. He now made rapid progress. His tongue became cleaner, the pain in the side greatly relieved, the heartburn left him, his appetite became steady and good, his strength greatly increased, and he felt so well that he made up his mind to discontinue the

treatment and go home. He was not, however, yet quite well, for as soon as he left off the treatment his health flagged, and he describes his feelings as resembling those of one who suddenly loses some long continued cause of excitement. He felt low, depressed, and was obliged to resume the treatment. After having undergone the treatment for some weeks longer, however, he entirely recovered both his health and strength, and could spend a whole day in climbing the mountains without suffering more fatigue than would necessarily be felt by a strong and healthy man. He has now been in perfect health for four months, during the whole of which time he has entirely discontinued the treatment, with the exception of an ordinary cold bath every morning. He only remains at Græfenberg on his wife's account, who has also been undergoing the treatment, and whose case he has likewise kindly permitted me to publish.

Mr. J. B. S—'s crisis occurred about the 8th week after he commenced the treatment, in the form of a thick rash, which entirely covered his legs, thighs, and arms. Immediately after the appearance of this eruption, the pain in the side began to decrease, and with it the eruption also

disappeared. He declares to me that he cannot remember the time when he felt himself in such good health and strength as he is at this moment.

GOUT AND RHEUMATISM,

COMPLICATED WITH VENEREAL TAINT.

CAPTAIN VOGT'S CASE.

For thirteen years this gentleman had been the subject of severe pains in his wrists, ancles, knees, and the long bones of his legs and thighs. While suffering thus, he contracted the venereal disease, of which he was not properly cured. From this time his rheumatic pains were aggravated tenfold; so much so that he was at intervals confined to his bed for several weeks at a time.

In this forlorn condition he arrived at Græfenberg, and was immediately put under treatment. The first crisis which manifested itself was a return of the chancre, which he had contracted six years before. This, however, got perfectly well in a fortnight. He has been here eight months, and when I examined him a few weeks since, he was completely recovered, free from all pain, active with his limbs, and able to take any reasonable amount of exercise on foot or on horseback. He is covered with a critical eruption all over his

limbs and body, and he only waits for the subsidence of this to return home. He was on full treatment the whole time, with the exception of the sweating blanket. He wore umschlags night and day, which, during the day, were renewed five times.

GOUT IN THE HANDS AND KNEES.

MR. ——'S CASE.

Mr. —, 45 years of age, had gout in his hands and feet for twelve years. He began the treatment in July, 1842. At six in the morning leintuch for half an hour—tepid bath for five minutes. At eleven and at five the same treatment repeated. He wore umschlags. On the second day he sweated for two hours—took a tepid bath for two minutes—after which a cold bath for one minute—then another tepid for two minutes. At eleven o'clock he took a foot bath for twenty minutes. At five o'clock he took a leintuch, for half an hour, with tepid, &c. &c., as in the morning. This treatment was pursued for ten days. After the tenth day, immediately after the sweating, a cold bath for a minute. In the third week he douched in addition to the other treatment, and wore wet bandages on the knees. He got well rapidly.

RHEUMATISM WITH PSORIASIS.

MR. G——'S CASE.

This gentleman is an officer in the army, aged 59 years. About twenty years since he began to be affected in the muscular part of the legs and thighs with very severe pains. At last they became so exceedingly sensible of cold and damp that, in frosty weather, while sitting within doors, he was always compelled to have the lower half of his body enveloped in a cloak, and no barometer could indicate a coming change in the weather with greater exactitude than this gentleman's legs. This state of things lasted, with little variation, for twenty years, not confining him to the house, but embittering his life, interfering with his prospects, and poisoning all the springs of enjoyment. During these twenty years he was three times sent home under a medical board as unfit for duty—once from the West Indies, once from the Mauritius, and once from New South Wales. His legs, I forgot to mention, had also become, very early in the disorder, covered with that obstinate itching disease, called psoriasis; and for several years any attempt to lean forward in the act of writing, gave him acute

pain in the region of the stomach. After having taken the advice of a multitude of physicians to no purpose, he was recommended to travel. He visited Wild Bad, in the Black Forest, Wild Bad Gastein, on the Norrishe Alps, Buxton, Bath, Ramsgate, and spent one whole winter in Italy; but all in vain. At last he heard of the water cure, and determined to visit Græfenberg, where he still remains, the very merriest man of the whole two hundred, who are now, in the very depth of winter, and with the snow a foot thick, gaily undergoing the water treatment at that place.

He has had crises, both in the form of rash and of furunculi. He has also had diarrhœa, which confined him to his bed for three days. During these three days he wore umschlags night and day changed every hour—with sitz baths. When the feet became very cold he had them rubbed with cloths dipped in cold water, and wrung out. In the evening he became feverish, for which he was put into a shallow bath for five minutes. This immediately removed the fever. When he was first attacked with diarrhœa his appetite went, and he could only take a little rusk in cold water. It soon, however, returned and

became better than ever. He is now in excellent health, his pains and the eruption rapidly leaving him, and he is looking forward with the utmost confidence to a perfect cure.

MR. BURCH'S CASE OF PSORIASIS.

Communicated by George Anthony, Esq., an English Surgeon, now at Græfenberg.

Mr. Burch, a farmer from Somersetshire, aged 50 years, a stout, strong man, came to Græfenberg in the middle of October last (1842). He was examined, and the progress of his case watched, with great interest by Mr. Anthony, and many others, resident at Græfenberg.

His whole body and limbs were literally covered with that most obstinate, and, generally speaking, hitherto incurable disease, called psoriasis. Deep fissures had formed in many parts, and an enormous quantity of scurf and scales were swept out of his bed every morning, while the itching with which he was annoyed was almost intolerable. It was that form of psoriasis which is sometimes called, though I think erroneously, lepra figurata. He had been afflicted with this abominable scourge for *many years;* and had consulted many physicians of acknowledged eminence with-

out the slightest benefit. Every mode of treatment which he had adopted had utterly failed of making the slightest impression on the disease.

When he consulted Priessnitz he was told that he would certainly get well, but that it was by far the worst case he had ever seen, although he had seen great numbers, and that it might take two or three years to effect a perfect cure. On hearing this he became disheartened, since circumstances would not allow him to sacrifice so much time. He was determined, however, not to return without making a trial. He went down the hill on which Græfenberg stands, into the town of Friewaldau, in which many of Priessnitz's patients, who cannot find room in Græfenberg, take lodgings. He here commenced the treatment, drinking large quantities of cold water, and confining his diet to bread alone. He continued this plan for about six weeks, when, to his joyful astonishment, as well as that of Priessnitz himself, the eruption almost entirely disappeared. In this case, the crisis showed itself in the shape of diarrhœa.

In order to produce perspiration he slept under a German feather bed, close to a German stove, which gave him a profuse perspiration every

night—an effect which his medical man had often laboured to produce in vain, and which he had never experienced for many years.

Having now remained as long as circumstances would possibly permit, he left Friewaldau to all appearance perfectly well, with the exception of a few isolated spots. On his way home he was accompanied as far as Prague by Mr. Ellis, a gentleman who is still at Græfenberg undergoing the water cure. Here he all at once returned to a very free diet. From a very scanty diet, and one consisting solely of bread, milk, and water, he leaped at once to the full diet of the fashionable continental hotels, with wine, &c. The consequence of this was a fit of the gout and a relapse. But from the very marked and powerful impression which was made by the treatment upon the disease in the short space of six weeks, no rational doubt can exist, and no doubt was entertained by any of the gentlemen who saw the progress of the case, some of whom were medical men, that the disease would have been entirely removed could the patient have submitted a little longer to the treatment, and confined himself for a longer period to a more rigorous diet. It should be remembered

that this gentleman was 50 years of age—that his disease had existed not merely for many months, but for many years—and that the various modes of treatment which he had adopted under the ablest advice had not only been unable to cure it, but even to make the slightest impression upon it.

SKIN DISEASES—PSORIASIS.

MR. WILLIAM HENRY SPANGENBERG'S CASE.

Mr. Spangenberg, a gentleman of Hamburg, a young man of very high attainments, and the son of the late very eminent Dr. Spangenberg, (about 24 years of age) had been afflicted with a scaly eruption over his face, and entire body and limbs, for twelve years. The disease first made its appearance in the form of red, itching patches. These became covered with small scurfy laminæ, or scales, which were easily rubbed off, leaving the patches red and shining as before. In a very short time, however, the scales were reproduced, and fell off as before. The itching was excessive, and this distressing condition continued for twelve years, in spite of the most varied and persevering efforts, under the most able medical advice to remove it.

In this pitiable state he came to Græfenberg, covered from head to foot, face and all, with a disease, at once loathsome, and, in an uncommon degree, distressing. His complexion was exceedingly fair, his eyes blue, and his hair flaxen—his temperament irritable. And it required a good deal of tact to accommodate the intensity of the treatment to the excessive sensibility of his skin, which made it frequently necessary to change it; for whenever it was urged too far, the disease was aggravated. By constantly varying the treatment, however, his skin became gradually accustomed to the impressions of the various baths, and when I arrived at Græfenberg his treatment consisted of two leintuchs every morning, one immediately after the other, (the former for half-an-hour, the latter for three-quarters) immediately succeeded by the cold bath. At twelve o'clock he took a wet sheet, and sitz bath. At five he took another leintuch for an hour and half, succeeded by another cold bath. All night he wore wet linen pantaloons, from his ankles up to his arm-pits. He also wore wet bandages round his arms. All day he wore wet bandages round the entire body and arms, which were renewed five times *daily*. In the summer months he took the blanket and

douched; but these it was found necessary to discontinue.

This gentleman's crisis assumed the form of diarrhœa, immediately after the occurrence of which, his disease began to disappear. I saw him almost every day, and examined him repeatedly. When I left Græfenberg, he was so nearly well, that a few isolated dark-coloured spots, indicating the parts where the disease had been most virulent, were all that were left.

HERR VON NEHEMET'S CASE.

The following case I detail for an especial purpose—for the purpose of showing in what manner the most obstinate diseases, especially of the skin, and painful rheumatic affections (so called) are constantly produced.

Herr Von Nehemet, a Hungarian gentleman, three years ago contracted gonorrhœa. After having vainly endeavoured to rid himself of his malady for nine months, it *suddenly disappeared* on taking a large *dose of cubebs*.

Soon after this sudden disappearance, an *eruption* showed itself on his face and nose, for which he took Pulnau water, which seemed to remove it. He was now, *to all appearance*, well; but the

suddenness with which both the original disorder and the eruption had ceased, made him distrust the soundness and permanence of the apparent cure. Distressed with this feeling of insecurity, and his family being at Græfenberg, he determined to go thither too, and submit himself to the Græfenberg treatment. He was soon satisfied that his fears were but too well-founded. For, shortly after he had begun to adopt the remedy, a crop of small ulcers made their appearance round the fundament. Similar ones soon showed themselves on his legs, and presently his hands and fingers became covered with pustules.

By slow degrees, however, the whole of these symptoms vanished, and his health was perfectly restored. He left Græfenberg while I was still there.

Now, I think it cannot be doubted that, when this gentleman's original disease so suddenly disappeared, his system *still retained the poison* with which he had been first inoculated. Nor can it be doubted, that if that poison had not been thrown to the surface by the treatment adopted, he must have become, at some future time, the subject of severe disease, of some kind or other.

I am persuaded that multitudes of anomalous

disorders, whose causes seem buried in obscurity, are occasioned by *suppressed poison*—and often by a poison of the kind here alluded to.

FISTULA IN ANO.

COUNT THUN'S CASE.

The young Count Thun, a youth sixteen years of age, became sensible of uneasiness in the neighbourhood of the rectum while passing his motions. This uneasiness gradually increased until it became so severe as to prevent him from riding on horseback. The parts were now examined by a surgeon, and found to be thickened, enlarged, and hardened. In a short time the pain became excessively severe, and other advice was taken, both at Vienna and Prague. It was determined to puncture the part. This was done, and a discharge of matter mixed with blood ensued. The disease was now pronounced to be fistula. Attempts were made to effect a cure, by means of injections thrown into the sinuses through the puncture; and that the case was one of perfect or complete fistula is proved by the fact that a portion of the injected matter always escaped through the sphincter, proving beyond question that the sinus opened into the bowel. A

great variety of injections having been used with no benefit whatever, the case was pronounced to be incurable without an operation. To this measure the young Count could not be persuaded to submit. He had now been under medical and surgical treatment for twelve months. He had five fistulous openings around the anus, and his system had been so much reduced that it was with the utmost difficulty he could walk, even when assisted by the arm of his father.

When I saw him he had been at Græfenberg eight months. For the first three months he took daily three wet sheets of an hour each—each being immediately followed by the cold bath. He wore umschlags round the body, and under the crutch night and day. At the expiration of three months he began to douche every day; and he has only now just begun to undergo the sweating process. He takes all his food, both meat and drink, perfectly cold. He has never taken a sitz bath; nor has he had any crisis.

After hearing the detail of the case from the father, whose memory was assisted by the son himself, I requested that I might be allowed to examine the parts. This request was immediately complied with. The scars left by the healing of

the sinuses were distinctly visible. But the thickening had disappeared, as well as the pain, which I ascertained by making firm pressure entirely round the anus, and especially upon the scarred parts. Four out of the five openings were perfectly and soundly healed, but there yet remained one, formerly as large as the tip of the little finger, but now not larger than a pin's head, to be healed.

Prepared as I already was by á priori reasoning from the nature of animal life up to the nature of animal disease, and from the nature of disease up to the true nature of remedies, to award great efficacy to the cold water cure, yet I must confess that if I had not witnessed this case and also the one which follows with my own eyes, I should have had great difficulty in believing the truth of the statement.

URINARY FISTULA.

BARON LAUENGEN'S CASE.

Baron Lauengen, of Lauengen, captain of cavalry struck himself a severe blow against the pommel of his saddle. Inflammation and much tumefaction ensued. After a time the swelling of the part was enormous, and fluctuation was distinctly

felt. An opening was made into it, very low down, from which there immediately escaped a very large quantity of urine. This puncture never healed, but the urine continued constantly to flow through it. He suffered from this state of things for two years, which two years were spent in fruitless endeavours, under the advice of the very best continental surgeons, to heal this fistulous sore. He then came to Græfenberg, where he has been, if I remember right, only eight months. He was kind enough to suffer me to examine the part, which I found to be perfectly healed and sound, the scar where the opening had been still remaining distinctly visible near the raphe.

GONORRHŒA.

A gentleman of Transylvania, a healthy man, twenty-eight years of age, contracted gonorrhœa. In spite of all the means which could be devised by his medical advisers, the disease continued for fifteen months. Four months after he had got well he contracted the disease a second time. The treatment he had gone through on the former occasion had been so painful as well as unsuccessful, that he could not make up his mind to submit to it again, but resolved to go to Græfenberg.

He was three weeks on the journey, and he had had the disease three weeks before he started. The disorder was of a virulent kind. The treatment which was adopted in this case was as follows: At half-past six in the morning he took a wet sheet. After the wet sheet he took a tepid shallow bath, at twelve degrees of Reaumur. After this (immediately) the cold bath, and directly after this the shallow bath again. At ten o'clock he took a tepid sitz bath, at twelve degrees, for half an hour. At five o'clock the wet sheet and all the treatment of the morning over again. He drank thirteen glasses of cold water daily, and wore umschlags round the abdomen day and night. This treatment continued for a week, but on the fourth day the disease had entirely disappeared. It was thought desirable, however, to continue the treatment a little longer. In the second week he took the two wet sheets as at the beginning, but went immediately after each into the cold bath, without the intervention of the tepid shallow bath. At ten o'clock in the morning be douched for five minutes, but not on the seat of the disease, nor on the stomach, nor on the head. At twelve o'clock he took a sitz bath *cold* for five quarters of an hour. At the end of the second week he left perfectly cured.

CONSUMPTION.

Extracts (translated from the Italian) from a letter received by J. B. S——, Esq., at Græfenberg, from Captain A. F. of the Marine Artillery, Venice.

Venice, 10*th Feb.* 1843.

* * * * Mr. and Mrs. H. are much obliged by your kindness, and have heard with great pleasure the good effects of the cure, on which they sincerely congratulate you, and return their kind compliments to you and your lady. The reading of your letter has determined H—— to visit Græfenberg next summer. He will profit by your advice, with respect to the method which you recommend him to adopt while there. Colonel S—— is very well; he says that he feels himself ten years younger, (since his visit to Græfenberg, 1842) and sends his compliments to you both.

With regard to my own case, it is given in few words. From my twenty-fifth to my thirty-first year, I was subject to frequent affections of the chest, for which my physicians ordered me to lose blood, and gave me palliatives, which treatment left me constantly liable to relapses. They said I was of a plethoric habit, and that I must have the

mass of my blood diminished. These diseases were produced by weakness brought on by a too sedentary life, too much application to study, and too free indulgence in wine and spirit. My constitution was extremely delicate, and the least draught of air caused inflammation of the lungs.

These affections of the chest returned three or four times a year, until the last time, 1827, the lungs were so much weakened that I could scarcely breathe. At this same period (I was then thirty-one years of age) I was at Zarra in Dalmatia, and had a severe attack which lasted several months, and of which I could not recover. I was confined entirely to my room. The physicians said that it would be death to me if I exposed myself to the open air. I had a consultation of physicians, at which Dr. Pinelli, the principal physician in Dalmatia, attended, and I was declared consumptive. I was studying at that time the German language, and whilst reading the "*Conversations Lexicon,*" I was struck with the article "Huffeland." In this article great praise was given to his (Huffeland's) work on Macrobiotics, (or the art of prolonging life). I obtained this work; and it seemed to me that I recognised my own case in it. As I was already quite given

up by the faculty, I thought that in my position as an officer it would be best for me to attempt an *heroic* cure, and to put an end to my disorders, either by death or recovery. I bade adieu to all my physicians, *in a half dying state,* and began to wash myself in my room with fresh water, by means of a sponge—repeating this operation several times a-day—and limiting my diet to vegetables, fruit, and water.

I began to feel benefit in a few days, and soon acquired courage to go out. In the course of forty days I was strong enough to begin sea-bathing. It was then the month of August, 1827.

The sea-bathing, which I took every morning, *in all weathers,* joined with exercise immediately after the bath, continually strengthened me more and more, and in the space of five months I found myself the strongest and the healthiest of any of my companions. From that time to the present day I have had no illness of any kind. I drink no wine, because I do not like it. But I *could* drink it without any evil result.

I prefer vegetable diet; but, for several years that I was at sea, I took animal food, without the least inconvenience. I expose myself to all

weathers—and go without a cloak, even in winter, in order to put my health to the proof. I go from a hot atmosphere into a cold one, et vice versâ, without any precaution. I wear no flannel, and lead a very irregular life.

In 1835, when I was on board ship, I was attacked, in the Port of the Pirœus, with an endemic fever, which raged there on account of the marshes; and which attacked three-fourths of the crew. On the *second* and *third* attack of fever, I took, each time, a bath in the sea, and recovered, while my companions were ill for *several months*.

The only precaution which I observe is to bathe every day in the sea, in all weathers, and in all seasons, when I have the opportunity; and to take a douche bath* for one minute, and wash myself all over with cold water, as soon as I get out of bed. I drink a great deal of cold water—from twenty to twenty-five beakers every day—chiefly in the morning before breakfast. But whenever I have been so situated that I could do *none of these things*, I have still felt myself perfectly well.

In short, at the age of forty-seven, I feel my-

* Three buckets of water poured over him.

self stronger than I was at twenty-five, before I was attacked by disease in my chest. This is the method which I followed before I had any knowledge of the method of Priessnitz, with which I only became acquainted five years ago when I returned from the Levant; and which has determined me to continue it, and to recommend it to all my friends.

If Dr. Johnson wishes to make use of this information I have no objection whatever. I only request him to put merely the *initials* of my name.

I request you to write to me before you leave Græfenberg, and to believe that I am and shall always be, with the most perfect esteem, &c. &c.

A. F.

Captain of the Marine Artillery.

MRS. J. B. S——'S CASE, RELATED IN HER OWN WORDS.

From a child I never recollect to have had strong health. I was constantly suffering from the illnesses incident to children, besides much cough, with tendency to weakness of the chest, for which at an early period I was ordered to wear a flannel dress next the skin. When at school

and whilst playing, I fell backwards over a garden roller, to which I paid no attention, although finding it difficult either to walk fast or to run for a few days. From this circumstance I think may be dated the weakness in my back, which was first evinced in a difficulty to rise from the ground, if I had been stooping or kneeling whilst at work in my garden; the feeling being a total prostration of strength from the lower region of my back, (precisely the part hurt) to the knees. Still I struggled against the weakness until I found myself incapable of walking up a slight hill with ease. Application was then made to the physician, by whom I was ordered to rub the part well with a liniment principally composed of essential oils, and which produced a discharge equal to that of a perpetual blister, and for a time restored strength to my back; but the disease invariably returned.

This state of debility continued until 1841, when I think it increased; if I walked up a long staircase, my strength was exhausted; the same indeed after any slight exertion. In 1842 I came to Græfenberg. I was ordered *to leave off flannel,* a leintuch for one hour to be succeeded by the abgeschrecktes bath, in which I was well rubbed for

a few minutes; an abreibung and sitz bath at eleven o'clock, and the same at four o'clock in the afternoon. In a fortnight I was ordered to plunge *once* in the cold bath, returning thence to the abgeschrecktes to assist the circulation of the blood. At the expiration of five weeks from my first arrival at Græfenberg, I was suddenly seized with an utter prostration of strength, so much so that my legs dragged, that I feared paralysis. This was succeeded by ague, shiverings, and burnings, pains from head to foot, but principally across the loins. A profuse natural perspiration relieved me of much uneasiness, and when Herr Priessnitz came he ordered an immediate abreibung with umschlags around the waist, to be repeated frequently so long as the pain continued violent in the loins. If I were better in the morning the bathing was to be continued as usual. This was done. When I attempted to walk after being dressed, I found myself incapable of the exertion, being weak almost as an infant. During two days I ate only a little bread and drank water, the food that my appetite asked for. In four days my strength had considerably returned, and in a week I was well as usual. After this fever I was ordered to douche, which in a very short

period produced considerable swelling in my left foot ; then I was ordered a foot bath, Priessnitz saying, "it was probable a crisis was approaching;" which took place in a few days, and which discharged as an issue for seven weeks. Another succeeded which lasted for five, and another afterwards for three weeks, more violent than the preceding, with a multitude of little ones ; and after each one I felt stronger and stronger, and now have to rejoice that all pain in the back, with that prostration of strength, and every other symptom of debility, headache, &c. &c., have apparently bid me farewell.

DEAFNESS.

While I was staying at Græfenberg, during the first week in January of the present year, (1843) Herr Fricks, a young Prussian, aged twenty-seven years, arrived from Stettin.

He had been totally deaf for ten years, his deafness having been produced by a severe attack of typhus fever. During the course, however, of the whole ten years his hearing returned three times, but only remained *a day or two,* when he became again as deaf as ever. Having undergone treatment *for twelve days* a large quantity of

matter issued from his nose. He immediately regained his perfect hearing, and remained quite well up to the time when I *left Græfenberg*—a period of about six weeks.

I will here relate an accident which befel this young man, in order to show that the water treatment is an edged tool which cannot with impunity be trifled with—and that, like every other remedy which is not mere chip in porridge, it is only safe in the hands of those who know how to adapt its use to the peculiarities and powers of individual constitutions.

He had been packed in the blanket; but, after having lain there for three hours, did not perspire. He was ordered therefore to be taken out and put into the *tepid* bath. The bath-servant, however, either to save trouble, or from misunderstanding, put him into the *cold* bath. The moment he came out he fell down, and remained perfectly senseless for more than an hour. Constant friction, however, with the wet hands, at length restored him.

DEAFNESS.

GENERAL BARON ESCH'S CASE.

General Baron Esch, commanding the cavalry at Prague, a gentleman well known in the mili-

tary world, and who made his first campaign with the Duke of York, at Dunkirk, in 1799, was afflicted with a confirmed deafness of several years standing, for which the most celebrated physicians in Austria had all been repeatedly consulted without relief. At last he was induced to go to Græfenberg, and consult Priessnitz, who told him he thought he could cure him, but could not say what length of time it might require. He was immediately put under treatment, and at the expiration of six weeks he had perfectly recovered his hearing. This case was related to me by Colonel Bowen, late of the Coldstream Guards, who is now undergoing the treatment for chronic inflammation of the eyes, and who was a personal friend of General Esch, and had the statement from his own lips. The General also related to Colonel Bowen, the case of a young dragoon officer under his command. See page 13.

HIP DISEASE.

ELIZABETH ST——'S CASE.

One of the first cases which attracted my attention, after my arrival at Græfenberg, was a case of hip disease, in Elizabeth St——, a child

eight years of age, and the daughter of highly respectable parents at Hamburgh. On inquiry of the child's governess, she stated that the hip had become enlarged rather more than two years ago —that the tumefaction gradually increased—that the child constantly complained of pain in the knee—that the leg and thigh became gradually wasted—that the knee joint became firmly contracted, and bent nearly at right angles, so that she could only walk with two crutches, the other limb being weak, and the general habit of the child *delicate,* and, in fact, scrofulous. Every medical man, if any such be present, will immediately recognise in this account a very common form of scrofulous disease of the hip joint. When I saw the child, however, all these symptoms had disappeared, excepting some remaining enlargement of the hip, and a little limping in the gait arising from a trifling shortening of the limb. But the account thus given of the child's condition, when she first went to be submitted to the treatment, was fully confirmed by the testimony of more than a dozen persons who saw the child when she was first brought to Græfenberg, and who had watched her progress with great interest. But besides this, the shortening

of the limb, the appearances of the hip, with the general constitutional aspect of the little patient, were precisely such as would have led any surgeon to foretel, without information, that the patient had suffered, or was about to suffer, the peculiar train of symptoms which the governess mentioned.

When I left Græfenberg, I saw this child galloping about in the snow, by the side of her governess, without anything to distinguish her from a perfectly healthy child, excepting a little limp in her gait.

SCARLET FEVER.

MRS. KLAUKE'S CASE.

In the month of May, 1842, Mrs. Klauke, (aged about 25) was seized with pains in the head and back and calves of the legs. Her face, neck, arms, and legs, and subsequently the whole body became brightly scarlet, and she complained of a soreness in the throat. The pulse was rapid, and skin dry. She was packed in the leintuch for half-an-hour; then rubbed all over in a tepid bath for twenty minutes with the wet hand. She was now ordered to wear an umschlag round her stomach night and day. When she felt cold she

was rubbed down with the wet sheet—when hot, packed in the leintuch; and so on all through.

The tepid bath was suspended until by the application of a succession of sheets the fever was reduced. Then the tepid bath was repeated. Every morning she was packed up in a blanket, in which she was allowed to perspire for an hour; then she was put into the tepid bath. This treatment was continued for a fortnight. At the close of the sixth day all fever was extinguished, and at the close of the whole treatment her strength was undiminished.

In addition to the above a lavement of cold water was administered every night. During the whole time she ate and drank as usual, and one evening went to a ball, (in the saloon of Priessnitz's establishment) and danced for hours, whilst her whole body was crimson with scarlatina. On returning home from the dance she was rubbed down with a wet sheet, went to bed, and slept soundly.

SYMPTOMATIC FEVER.

A. KLAUKE'S CASE, RELATED BY HIS MOTHER.

Alexander Klauke, aged three years, was a fine lively child, but with a disposition to inflamma-

tory affections of the stomach and bowels. A month previous to the present disease he had an attack of inflammation of the stomach, accompanied with strong fever, and determination to the head. In the evening the child was put into a bath not quite cold, in which he remained about twenty minutes, additional cold water being added as the temperature arose by the heat from the child. During this time cold water was poured from a tumbler glass on the head, repeated at intervals of a minute, and, as is usual, his whole body was rubbed cautiously, by the maid. He was then taken out of the bath and placed on the sofa, covered over with a sheet and blanket, with the back part of his head in cold water, for ten minutes. By this time reaction had taken place, when wet compresses were applied to the head and back part of the neck, and the body, from the arm pits to the hips, wrapped in a similar way. He slept quietly till three o'clock in the morning, when the same process was repeated, the previous symptoms having returned. The child was again placed in bed, where he slept till morning, and was then found to be quite well, and went out as usual.

A month after this attack he was taken ill in

a similar way, but with symptoms much more severe. The fever running high and accompanied by delirium. The treatment was commenced by placing him successively in nine wet sheets, from which the water was but slightly wrung out. In each of these he remained about five minutes. Towards the last, the heat being diminished, he was allowed to remain ten minutes. To the head and breast a thick wet compress was applied in addition, these being the parts where the heat was greatest. The feet were cold, and as long as they remained so the wet sheet was only applied down to the knees; in the meantime the feet and legs were rubbed strongly with the hands. While the extreme heat continued, the wet sheet was covered by a thick dry one instead of a blanket, as is usual, the feet only being covered (with the blanket). After the last wet sheet he was placed at once in a tepid bath, where he remained an hour, the same process of rubbing and pouring water over the head being practised. The first day the same process was repeated four times, the duration of the last being not so long, when the fever was not so high. During the night the wet cloth was changed every half hour. On the morning of

the second day the child refused to go into the water, calling out himself at intervals for additional wet sheets. Orders were given that the inclination of the child should be obeyed. In the course of the morning the child desired himself that he might be put into the bath, where he remained until the heat in the armpits and on the back of the neck was the same as on the rest of the body; this being the general guide for the duration of a bath.

The same treatment slightly varied was continued four days, when the child was well, and was sent out to play with the other children. In eight days after this a pustule appeared on the foot, which discharged matter freely.

CATARRH OR COLD.

Mrs. —— an English lady now at Græfenberg, on her husband's account, was subject, in England, to very severe attacks of catarrh, which usually lasted her a month before she could get entirely rid of it. Soon after her arrival at Græfenberg she had a very severe attack. She was treated by the wet sheet and tepid bath alternately for *two days* which entirely removed every trace of the catarrh.

BALDNESS.

ASSESSOR WILLERT'S CASE.

This gentleman came under the hydrotherapeutic treatment for a very old rheumatic affection. When he arrived at Græfenberg his entire head was perfectly bald and smooth. I had an opportunity of examining his head soon after I myself reached Græfenberg; which I did with the more care, having heard that it was expected, during his treatment, that his hair would probably return. Shortly before I left Græfenberg I was requested to go and examine Assessor Willert's head once more. I did so, and found it everywhere covered with a fine new hair, nearly half an inch in length. There can be no doubt whatever that this gentleman's head will shortly be covered with hair as luxuriant as at any former period of his life. His age, judging from his appearance, (for I did not inquire) is about seven or eight and thirty.

HEAD-ACHE WITH GIDDINESS.

HERR SLATINSKY'S CASE.

To the gentleman (about forty years of age) whose case I am now about to relate I was introduced by Mr. Niemann. On going to his room I found his body literally covered all over with large dark brown spots, some about the size of a farthing, some as large as a halfpenny, and others somewhat larger, and many of them running one into another, giving to his skin a dark marbled appearance. He had also had crises in another form about his legs and arms, very much resembling what, in England, are commonly called boils. They seemed to me to partake of the nature of what are denominated, in medical phraseology, furunculus—not malignant, but in a very mild form—discharging a ropy matter from one small pin-hole in the centre. All these, excepting one on the breast, were perfectly healed.

The eruption on the body, however, had but just made its appearance, and the patient was in high glee, and exhibited his mottled skin with all the pride and satisfaction with which a man exhibits to his friends some long-desired object—

a horse, for instance, or some precious antique—which he has just succeeded in obtaining after much labor and difficulty. The whole time he was undressing a smile of exultation was playing round his mouth, which plainly said: "what a happy fellow am I! and how much I am sure you will envy me when you see the treasure I am about to show you—the blessed blotches wherewith I am blessed!" And this is the feeling which is common to all the patients at Græfenberg on the appearance of the crisis—for it is invariably hailed as a certain harbinger of a speedy and perfect restoration to health. As the crisis disappears the health returns—and I have never either seen or heard of a single case in which these eruptions did not entirely vanish again, leaving the skin perfectly healthy and clear as before.

For the three years previously to his coming to Græfenberg, this gentleman had been grievously afflicted with violent pains in the head, accompanied by dizziness. He was unable to attend to any kind of business. He could neither read nor write for more than two or three minutes together. He felt as though two nails, one on either side of the forehead, were being violently thrust into his

brain. And he could never stoop nor turn round without imminent danger of falling. This was his condition for three years, from which all the ordinary medical treatment had failed to relieve him.

I forgot to mention that, in addition to his other sufferings, he was afflicted with piles.

On the appearance of the first crisis all his symptoms were relieved, but not removed. Since the appearance of the second, however, his headache, his giddiness, his piles, have entirely left him, and he now only waits till the critical eruption shall also leave him, when he will return to his country, his family, his friends, and his home, freed from a load of misery and disease which could not but render life rather a curse than a blessing.

SECONDARY SYMPTOMS.

COUNT PYATCSHAVICH'S CASE.

This gentleman, a Polish count, contracted syphilis. Under a course of mercury all his sores healed except a large one in the groin, which obstinately resisted all medical treatment. His health at last began to flag. He lost both his flesh and his strength, and became reduced in

substance even to emaciation. This state of things continued for one entire year, when, hopeless of relief by ordinary means, he yielded to entreaty, and, in spite of strong prejudice against the treatment, came to Græfenberg. In six weeks he was perfectly well, and I myself saw him depart, the picture of health and strength—a fine young man standing six feet without his shoes, and as strong as a giant.

MR. ROBERTSON'S CASE.

—— Robertson, Esq., a Scottish gentleman, contracted chancre in Sicily, 1838, which was healed by external mercurial applications. He took mercury internally also, but it failed in producing ptyalism. The chancre returned in a short time, and continued to heal and return at intervals, during the space of six months. During these six months he took *four pounds by weight of Lafecteur's rob* (a concentrated preparation of sarza and other drugs) and sixteen pounds by weight of Dupuytren's rob. He was then ordered to rub in mercury for what were called secondary ulcers; and these ulcers never healed until all these medicines and all mercurial applications were discontinued. But under the use of simple

purgatives, washing the sores with nothing but goulard water, they healed in eight days. But by this time his system had become so broken up that pressing fears were entertained for his life. He had become quite emaciated—the slightest exertion, or a sudden noise, would cause him to faint—his spirits were depressed even to frequent weeping—the inside of his mouth, his tongue, cheeks, and throat, were covered with excoriations and sores—*the skin of his face and forehead was covered with blotches*—and his stomach and bowels in so irritable a condition that when he took a plate of hot soup he was obliged to sit upon a commode while eating it. For this excessive irritability he was obliged to take large quantities of opium, which he did under the advice of his physician. At this time the joint of his knee was larger than the thickest part of his thigh. He was now removed to Naples, and placed under the care of another physician, who gave him iodide of potassium. From this he derived great benefit, the sores healing and the blotches disappearing. He was desired to travel, but never to return to a hot climate. His health now became considerably better, but the disease was still in him, for it was not long before

the blotches returned, and he was obliged to have recourse again to the iodide of potassium. And indeed he soon found that in order to keep the disease under, it was necessary to take the iodide of potassium constantly. He now took warm sea-bathing at Peterhead, which brought out several ulcers in the part first affected. After this he took sulphur baths, and also some iodine administered by Mr. Callaway, one of the surgeons to Guy's Hospital in the Borough.

He now came to Græfenberg, and submitted himself to a full course of the water cure. When he came there, the skin of his face was so excessively irritable that he could never go out without an umbrella to protect his face from the wind.

He had not been under the treatment long before the disease, which had been hitherto only suppressed, was driven by the water to the surface of the body. He became covered with venereal eruptions, and no fewer than twenty-one ulcers reappeared on the part originally infected. As soon as these appeared, his general health began to mend, and in a few months he was perfectly well, and offered for a wager of any amount to walk eighty miles in two days—forty miles each day. He has just left Græfenberg for Vienna, and

related his case to me only a few days before he went. This gentleman was so popular at Græfenberg, and (having the command of several languages) so kind in interpreting for foreigners when they first arrived, that a dinner was given to him at Friewaldau, at which I had the honor to be present.

This gentleman also mentioned to me a case of gleet which came immediately under his own notice. It had existed for seven years, and obstinately withstood every mode of treatment which could be devised. Under the influence of the water treatment he got perfectly well in a few weeks.

MR. KINDERMANN'S CASE.

Mr. Kindermann, a government reporter at Frankfurt on the Oder, was affected with secondary symptoms. He had a venereal fungous growth on the verge of the anus. There were also deep ulcerations on his thighs. Having failed to obtain any relief, and his health having been to all appearance utterly ruined, it was proposed to convey him to La Charité, the great hospital at Berlin, as a last resource. His physician, however, declared that such a step would be perfectly

useless, and nothing could save his life. Soon after this he was strongly urged to visit Græfenberg, whither he was conveyed in the latter end of March last year. In the beginning of July of the same year he left Græfenberg in perfect health and strength, and is now again residing at Frankfurt on the Oder.

This gentleman is about twenty-six years of age.

He sweated every morning, with cold bath—two leintuchs in the afternoon with cold bath again—once a day he took a sitz bath—and he wore umschlags night and day. He was covered with crises, observed a strict diet, and almost lived in the open air.

CASE OF HERR VON GOLTZSCH.

About seven years ago this gentleman contracted chancre, which was cured by mercury. From that time his general health began to decline. Every now and then he had sore throat, and was scarcely ever free from what he at that time believed to be rheumatic pains. For six years this state of things continued, during the whole of which time he was so weak that a strong child running against him was sufficient to push

him down. At last his shin-bones became attacked with the most excruciating pains the moment he became warm in bed, which made it impossible for him to sleep. Shortly after this nodosities made their appearance along the whole course of the bones. He was now strongly urged to come to Græfenberg, where I had the pleasure of seeing him, and of examining his legs. He has been under treatment for eight months, during which time his throat has not once been sore. He has entirely lost all his pains, and, on questioning him as to the state of his physical strength, his emphatic reply was: "when I came here I was as weak as a child; but now I would not turn my back upon ten devils.

IMPUISSANCE,

COMPLICATED WITH GOUT.

The uncle of the reigning Duke of Nassau, between sixty and seventy years of age, had been afflicted with gout so severely, that when he arrived at Græfenberg, he was almost bent double. In addition to this he had become impuissant.

He remained at Græfenberg for two years, married while there, and in due time became the

father of two children; and was, moreover, perfectly cured of the gout.

There are probably no two affections over which the hydropathic remedy exercises a more marked and beneficial influence than it does over the two just mentioned.

CONTRACTED JOINTS.

CASE OF A HUNGARIAN GIRL.

A Hungarian girl was brought here with the knee joint so much contracted that she was obliged constantly to walk with two crutches. In six weeks she left Græfenberg walking exceedingly well without any crutch at all.

HERNIA.

A young man affected with inguinal hernia consulted a surgeon at Milan, who undertook to cure him.

The surgeon applied a plug of wood to the rupture, supported by a strong band of iron, which produced ulceration to a great and painful extent. At the end of six months the hernia was no better, and he suffered severely from the ulcerations.

He then repaired to Græfenberg, where he has

been prosecuting the hydropathic treatment for six months. The ulcerations are quite healed, and his rupture so much better that he has already left off his truss, and Priessnitz assures him that there is no doubt of his perfect recovery.

HÆMATURIA,

OR VOIDING OF BLOOD FROM THE URINARY ORGANS.

HERR ZELOWSKI'S CASE.

Herr Zelowski had bleeding from the urinary organs almost daily for six months before his arrival at Græfenberg. On one occasion he voided a large tumbler-ful of pure blood. He was also the subject of piles. After ten weeks of treatment he was entirely freed from both disorders. He gave me the history of his case himself, on the evening before he left Græfenberg.

CEREBRO-SPINAL DISEASE.

MONSIEUR DE GALETTE'S CASE.

Monsieur De Gallette, an officer in the Imperial Guard of Russia, aged thirty-five years, was affected about two years since with severe giddiness in the head. He could not look vertically upward without falling either on his knees or

on his side. Any sudden motion of the head deprived him in a moment of the use of his lower extremities, which immediately yielded to the weight of his body, and let him down.

He lost also the perfect command of his tongue, so that he could not articulate the words which he desired to utter. His memory too quite failed him, and all his faculties were so disordered that he became quite foolish and unfit for society. One day in a room full of company, he took up a decanter of water and emptied it completely upon his own head, not knowing what he was about, and wondering where the water came from, which was running down his clothes. This gentleman has been four months under the water cure. His giddiness has left him, he can articulate every word with the greatest facility, he has quite recovered his memory, and all his mental faculties are as perfect as ever they were. He complains now of nothing but physical weakness, from which, however, he is daily recovering. But the most remarkable part of this case still remains to be told. This gentleman has been quite bald for *fifteen years* over the entire roof of his head, and down on either side to within an inch of the tips of his ears, for which he has always worn a

wig. When he had related his case, he requested me and some other gentlemen to raise the candle and examine the bald part of his head. We did so, and then distinctly perceived that a fine downy hair is beginning to grow all over the bald part, which promises in a month or two entirely to cover it, and supersede the necessity for a wig. The hair is already a full quarter of an inch in length, but exceedingly fine. A hundred persons can vouch for the truth of this statement, amongst others Colonel Bowen, Mr. Hoppner, and Mr. Anthony, an English surgeon, who examined the case with me.

SUPPRESSED MEASLES.

MAJOR HEISE'S CASE.

In June, 1812, Major Heise, in the Hanoverian service, while on active duty, had measles, during which disease he received orders to march to Valladolid in Spain, and performed the route from Madrid to Valladolid on horseback. On the march he was exposed day and night to the open air. The measles suddenly disappeared. Six months after this his body and limbs became covered over with a dry scaly eruption, exhibiting

a yellowish brown patchy appearance, when the scales fell off, accompanied by intolerable itching. Every expedient was tried in order to get rid of this eruption. He visited the baths of Germany, Switzerland, and Italy. He took Russian vapor baths for twenty years. But all perfectly in vain. Six years ago he was attacked with diarrhœa and prolapsus ani, occasioning from ten to twelve motions daily, with constant desire to return to the water-closet. With these symptoms he came to Græfenberg. Added to this he had nervous twitchings of two years' standing. Two weeks after he had been under treatment he had fever with delirium, with loss of sleep and appetite, for which he took leintuchs and tepid bath. This lasted a week, and was succeeded by good appetite and returning strength. Crises consisting of furuncles now set in, which lasted nine weeks. At the end of three months he was ordered to go to Vienna and to adopt the following more moderate treatment, viz., three abreibungs daily. Five days after his arrival diarrhœa and frequent desire for stool left him. At first his treatment consisted of leintuchs, cold baths, sitz baths. On returning from Vienna he took six leintuchs of half an hour each, and each being immediately

succeeded by a cold bath daily—douche for five minutes daily. Umschlags were worn night and day on his body, legs, and head. He was here six months, at the end of which time he went away perfectly free from all pain, in fresh and strong health, and in all respects perfectly well. Just before I left Græfenberg Priessnitz received a letter from Major Heise, in which he expressed his great gratitude for his recovered health.

AGUE.

A general officer in the British army, well known at the horse guards, still staying at Bœmischdorf, and whose permission I have to give his name to any private applicant, was attacked with ague. After enduring two or three fits, in the hope that it would leave him, he sent for Priessnitz. When Priessnitz arrived he was in the third or sweating stage. He was immediately placed in a bath at 16 degrees of Reaumur, or 68 of Farenheit. Here he was kept for 20 minutes, being well rubbed all the time by two men. After this he walked about the apartment for half an hour, and then went to bed The ague left him, and never returned.

DEAFNESS.

Colonel Bowen, late of the Guards, has been residing at Græfenberg seven months, without the slightest benefit in his own case. He cannot, therefore, be reasonably supposed to be blinded by any violent prejudices in favour of hydropathy. But he related to me the following circumstances concerning an intimate friend of his own—and it was afterwards confirmed by many others who were themselves under treatment at the same time with the colonel's friend. General Baron Esch, lately dead, but at that time commanding the cavalry at Prague, a gentleman extensively known in the military world, and who made his first campaign with the Duke of York, at Dunkirk, in 1799, was afflicted with deafness, of several years' standing, and which had resisted the most judicious treatment. He was at last prevailed on to submit himself to the water remedy—and in six weeks he had *perfectly* recovered his hearing, in the fullest sense of the word. Witnessing, with his own senses, the singular effect which had thus been wrought on his friend's ears, it was *this* which determined *Colonel Bowen* to try the *same* remedy on his own eyes—but hitherto without effect.

EPILEPSY.

The next case which I shall mention is one of epilepsy. On being introduced to this patient, a young Hungarian of about 27, he told me that he had been the subject of epilepsy for four years, having a recurrence of the fits about every ten days. He had been under treatment for four months, and was kept on a very scanty diet the whole of that time. He is now perfectly recovered, having had only one fit since he commenced the treatment, and that occurred *shortly* after his *first arrival* at the establishment. He was very pale, and considerably wasted, but was then gradually returning to a full diet, with a view to his returning home.

I suppose this case to be one of epilepsy, depending on irritation, set up in the brain, by the presence of some foreign body, probably a clot of blood; and that this clot, under the deprivation of food, had entered into combination with oxygen, in order that it might assist in protecting the vital organs from the destructive action of that element, and had quitted the system in the form of oxydised products. The cases of palsy probably depended on similar causes, whieh are removed by similar means.

This gentleman has made copious notes, both of his case and of his treatment, which he intends to publish as soon as he returns to Pesth.

HYPOCHONDRIASIS, PSORIASIS, AND SCIATICA.

The gentleman, (an Englishman) about 60 years of age, who was the subject of these three severe afflictions, belonged formerly to the civil service in India. I made his acquaintance at Græfenberg immediately on my arrival, and am indebted to him for introductions to several valuable cases besides his own. He had laboured under these affections for eight years. Shortly after he had become the subject of sciatica and psoriasis, (which latter disease his French medical advisers denominated dartre farineuse) his mind became excessively excited by some family occurrences, with the particulars of which he did not, of course, think it necessary to acquaint me. In a short time, what with this excitement, the torture arising from his sciatica, (inflammation of the sheath of the great sciatic nerve where it passes through the structure of the hip) and the intolerable *itching* produced by the skin disease,

the equilibrium of his mind became so much disturbed that he was not considered in a fit condition to be left by himself. Always in a state of high excitement, there were times when he was perfectly insane.

For eight years the sufferings of this poor gentleman, bodily and mental, were indeed awful. When I asked him to give me a detailed account of his sufferings, he sat thoughtful for a moment, and then, going to a table, he took up a small pocket book, and opening it at a particular page, and placing his forefinger between the leaves, he re-seated himself. "Some time ago," said he, "I was perusing the book of Deuteronomy; and in the course of my reading, the passages which I have copied into this pocket-book riveted my attention. They were so exactly characteristic of my sufferings, that I almost fancied myself the particular object of the divine wrath, and that I was even then realizing the fearful denunciations which those passages of scripture contained. No language of mine can so truthfully or so forcibly convey to you the horrors under which I was labouring both in body and mind. Read them," continued he, "and judge whether I have not great reason to be thankful that I am *now* such as you see

me." He handed me the book and I read as follows: "The Lord will smite thee with the botch of Egypt and with the emerods, and with the scab, and with the itch, whereof thou canst not be healed. The Lord shall smite thee with madness, and blindness, and astonishment of heart. The Lord shall smite thee in the knees, and in the legs, with a sore botch that cannot be healed, from the sole of thy foot to the top of thy head: and thy life shall hang in doubt before thee; and thou shalt fear day and night, and shalt have none assurance of thy life. In the morning thou shalt say, 'Would God it were even;' and at even thou shalt say, 'Would God it were morning!'"

"At the time," continued he, when I had done reading, "that I was perusing those passages, those terrible denunciations were most of them actually realized in my person. I trembled as I read—for at that moment I was covered '*from the sole of my foot to the top of my head*' with an intolerable itching botch. I was even then '*smitten in the knees and in the legs with a sore botch,*' and was covered with *scabs*. Madness, and blindness of the understanding, and astonishment of heart, were also mine. I had indeed '*no*

assurance of my life,' for I was often sorely tempted to destroy it; and every morning I wished it were night, and at night I longed for the morning—and every effort I had made to get '*healed*' had been utterly in vain."

This gentleman had then been under the water cure about three months. His sciatica had entirely left him—the eruption was nearly gone —the itching had wholly ceased—while the state of his mind was perfectly calm, cheerful, rational, and full of thankfulness.

So fully satisfied was he that he should get entirely well, that he left Græfenberg about a week before myself, in order to bring the whole of his family back with him—partly that he might have the comfort of their society for the rest of the time that it would be necessary for him to remain under the cure, and partly in order to submit his daughter, who had ill health, to the same remedy which had proved so signal a blessing to himself.

I have now stated my facts, and proceed to show that they are precisely such as the present state of science, and all general and analogical reasoning should lead us to expect and

not to wonder at. And I entreat the reader not to feel impatient if he meets, in the early part of what follows, with much which *seems* to have no concern with the "water cure." The water cure is directly and intimately concerned with the whole of it. I wish the reader to *understand* the water cure. But no man can be a judge of the soundness and durability of *any* superstructure unless he be well acquainted with the *nature of the foundation* on which the building is erected.

PART II.

CHAPTER I.

If we look, not merely with the bodily eye, but also with the eye of history, over the surface of the civilized world, we shall observe, perpetually appearing and disappearing, reappearing and vanishing, certain structures, reared by the hand of man, such as monuments, statues, churches, bridges, theatres, castles—tombs, temples, and towns—palaces, pyramids, &c. With regard to these, we observe that they are of almost infinite variety in form, size, and appearance, from the peasant's cabin to the baron's castle—downwards from the pyramids of Egypt to the single stone which marks the last dwelling-place of the village cottager—and upwards from the humble country village to the mighty magnificence of our modern Babylon. Yet if we examine them more minutely we shall find that this great variety of form and

appearance is produced merely by the different modes and proportions in which no more than four principal materials are combined. These are stone, wood, metal, and cement.

There are a few more unimportant matters which sometimes enter into their combination, as paint, glass, &c.—but the four I have mentioned are all that are essential.

We shall remark also, with regard to these structures, that each has its period of existence, which is shorter or longer, according to the strength of its original constitution or combination—some crumbling to pieces at the expiration of a few years, while others resist destruction for as many thousands—but *destruction*, however protracted, we observe to be, sooner or later, the *inevitable fate of all.*

A question now naturally arises: "What is the cause of this universal destruction? What invisible hand is that which is thus incessantly employed in pulling to pieces the labours of man, and triumphing unseen, in the destruction of his mightiest works?" It is that omnipotent element which chemists call OXYGEN—the oxygen of the air and of water. No sooner have human ingenuity and labor begun to erect their fabric, than

this unseen enemy instantly attacks it at every point. The oxygen of the air and of water, uniting with certain of the elements of the structure, new compounds are formed, which separate and fall from the parent mass; having, in this new state of combination, lost the affinity which before bound them to it. Thus the oxygen of the air and of water, uniting with the outermost layer which constitutes the surface of an iron pillar, forms that compound of oxygen and iron which we call rust. This falls off, and thus a new surface is exposed to be affected and transformed in a similar manner. That enduring stone, called granite, always contains more or less iron within its texture. The oxygen, uniting with this iron, converts it into rust, which falls away; and thus, by a slow and imperceptible, but inevitable operation, the stone becomes disintegrated, and finally crumbles away.

There are other unseen agents always at work, as carbonic acid, electricity, &c. But these are of minor importance—mere secondary auxiliaries. The prime agent, the arch destroyer, is oxygen. "The aqueous vapour," says Sir Humphrey Davy,* speaking of the causes by which the

* Page 253 of the Last Days of a Philosopher.

products of all human labor and ingenuity are, sooner or later, inevitably destroyed—"the aqueous vapour, the oxygen, and the carbonic acid gas are constantly in combined activity, and *above all,* the oxygen." Again, "Oxygen gradually destroys the equilibrium of the elements of stones, and tends to reduce into powder—to render fit for soils—even the hardest aggregates belonging to our globe."*

If we now again look over the surface of the earth we shall observe certain other structures or edifices, not the works of man, but those living fabrics, called vegetables. Regarding these living edifices with a philosophical eye, we shall observe, notwithstanding the great dissimilarity in their origin, structure, and external appearance, which distinguishes them from the works of man—we shall observe, I say, in other respects, a strong analogy between them—the only *essential* difference being in the power which rears them, and in the form and magnitude of the individual separate materials of which they are composed. In the mechanic structure, these are large and easily recognisable by our senses, as stones, masses of wood, &c.—while in the vegetable

* Page 254 of Last Days, &c.

structure, they are so minute that our senses are only enabled to recognise them by scientific expedients; and they are piled, one upon another, by an invisible workman.

The mechanical edifice is raised by human agency—the vegetable, by the invisible agency of what is called the vital principle, law, or force. I prefer the term vital force.

The mechanic edifice has its period of existence —so also has the vegetable. And in both, this period is liable to be shortened by accidental circumstances. And in both, its duration will be apportioned to the power of the affinity (vital in the one, cohesive in the other) which holds their elements together.

With regard to the mechanic edifices, we observed a great *disparity* in the duration of their existence. So also in the vegetable we remark that, while some endure but for a few months, others, as the oak, will resist destruction for nearly a thousand years.

In the mechanic edifice we have already observed that all its multiform variety is brought about merely by the different modes and proportions in which no more than four (principal) materials are combined—stone, wood, metal, and cement. So,

in the vegetable edifice, an infinite variety in form, size, appearance, &c., is effected merely by the different modes and proportions in which four (principal) materials, or minute masses of matter, are piled upon and united with one another—oxygen, hydrogen, nitrogen, and carbon.

No sooner is the mechanical edifice completed (and indeed before) than it is instantly attacked, at every point, by the oxygen of the air and water, by which it is ultimately resolved into new compounds, and thus destroyed. Precisely the same fate awaits the vegetable. No sooner is its growth completed, than some of its elements are seized upon by the oxygen of the air, its substance is rapidly disintegrated, and its elements restored to the bosom of nature, from whence they had been withdrawn by the agency of the vital force, to serve a temporary purpose—to serve the purpose of giving to the elements of matter that temporary *form* and use which we call a vegetable—just as the builder collects from the lap of nature his materials of stone, wood, metal, &c., which he piles together, according to a definite arrangement, in order to serve the purpose of giving them that temporary form and use which we call a cathedral. There is this unessential difference, however,

between the mechanic and vegetable fabrics. While the former are yet GROWING under the hands of the builder—ere the stones, &c., have left the workmen's hands to assume their places in the new edifice, the oxygen of the air has already commenced its work of disintegration—and the building *begins* to perish as soon as it *begins* to exist. This is not so with the plant. While the process of growing or building up of a plant is going on, oxygen possesses no power over it. During this period the vital affinity by which the elements of the plant are held together is *stronger* than their affinity for oxygen; and thus the vital force successfully and completely *resists* the disintegrating force or power of the oxygen. As soon as the plant, however, has ceased growing—as soon as the entire vegetable edifice has been perfected—the vital force becomes extinct—all *resistance* ceases—the oxygen of the air instantly seizes upon its elements—carries them off—and returns them to the storehouses of inorganic nature. And thus, "whilst water uniting its effects with carbonic acid, tends to disintegrate the parts of stone, the oxygen acts upon vegetable matter. And this great chemical agent is at once necessary *in all the processes of life, and in all*

those of decay, (as we shall presently observe) in which nature, as it were, takes again to herself those instruments, organs, and powers, which had for awhile been *borrowed* and employed for the purpose or the wants of the living principle."*

The entire life of a plant is occupied in growing. To whatever period its existence may be protracted, an *increase of mass,* or constant building up, during the whole time, is going on. And this circumstance constitutes a fundamental difference between vegetable and *animal* life.

I have drawn this short parallel between the vegetable products of the vital principle, and the products of human ingenuity and labour, in order to show the universal and destructive agency of oxygen, both in the organic and inorganic kingdoms of nature. I am anxious to fix attention upon this wonderful element; partly because, being invisible, it is extremely apt to escape our notice—and partly because I shall presently have occasion frequently to refer to the momentous part which oxygen plays in the phenomena of animal life—and lastly, because it is absolutely necessary to understand the nature, uses, powers and importance of this element, in order to under-

* Sir H. Davy's Last Days, &c., p. 253.

stand the phenomena of life, health, and disease —without understanding which it is clearly impossible properly to appreciate the means necessary for the removal of disease, the preservation of health, and the prolongation of human life.

I shall now endeavour, shortly and familiarly, to explain the nature of animal life, and by this means to convey a clear idea of the phenomena of *human* life. Having done this, I shall then proceed to show in what manner the phenomena of life, and consequently the phenomena of health and disease, are influenced by the remedial treatment practised by Priessnitz at Græfenberg.

A plant, during its life, is constantly occupied in eliminating from the waters of the soil and from the air, by means of its roots in the one instance, and its leaves in the other, those elements and combinations of elements which are proper for its nourishment. These new elements and combinations of elements thus introduced, by means of its roots and leaves, into the system of the plant, undergo there certain chemical changes and new combinations until they are finally resolved and converted into the several constituent parts of the plant itself. And these chemical processes, modified and regulated by the vital

force, constitute the life of vegetables. From this it will be seen that vegetable life is one continued process of accretion or growth—and that, while life lasts, the plant must continue to *increase in mass*—which is the fact.

In vegetable life there is no alternation of *waste* and supply as there is in animal life. The supply of new matter is perpetual—but there is no *waste*.

In the young of animals before birth life is purely vegetative—carried on without consciousness, without voluntary motion, without the generation of animal heat, without waste—and consisting in those chemical changes (modified by the vital force) among the elementary particles of the nutritious blood conveyed to it by the parent, by virtue of which chemical changes they are recombined and finally transformed into the several constituents of its own tissues.

The fœtal heart, endowed as it is with an irritability which it derives from its nerves, is made to contract by the stimulus afforded it by the presence of blood ready prepared in the parent organism. With the unessential exception of these involuntary motions, life before birth is purely *vegetative*, and the fœtal animal is an aquatic vegetable.

We now come to the consideration of animal life soon after birth, adult animal life, and the animal life of old age.

Immediately after the birth of the young animal certain remarkable changes in the mode of its existence are observed. Certain of its organs are called into activity which before were dormant. The chief of these are the stomach, bowels, and digestive apparatus—the lungs, organs of sense, voluntary muscles, with the brain and its appendages of nerves, &c. Of the offices performed by these organs, some are absolutely essential to life, and others not so. The offices of assimilation, performed by the digestive apparatus, and respiration, performed by the lungs, are essential to life. But voluntary motion, performed by the muscles—consciousness, intellect, and sensation, performed by the brain and nerves —and the offices performed by the organs of sense, as vision, &c.—these are not necessary to life. For "the process of nutrition proceeds in those parts of the body where the nerves of sensation and voluntary motion are paralysed, exactly in the same way as in other parts where these nerves are in the normal condition."* And ex-

* Liebig.

perience assures us that a blind man may enjoy as good health as one who can see. While the life of the animal *before birth* proves beyond question that life can go on independently of consciousness and intellect.

Before birth, life is purely vegetative, consisting only of those actions which are concerned in nutrition. *Before* birth, it can, like the vegetable, do nothing but grow; *after* birth that vegetative, or nutritive, or growing life still remains—but there is superadded to this *another* life, or set of living actions, consisting of all those phenomena which result from the operation of causes upon organs (those which I have enumerated above) which organs, before birth, were out of the reach of these causes, and which therefore remained inactive from the want of causes to excite them to action.

For the support of merely vegetative life these organs were not required.

After birth, however, life, that is, the processes by which the animal is kept alive, ceases to be merely vegetative, and becomes animal. If the life of the animal after birth continued to be merely vegetative, the animal would, according to the law of vegetative life, continue to increase in

size as long as it lived. Some contrivance therefore was necessary in order to prevent this continued increase of mass, and to fix a definite *limit to its size.*

This contrivance we behold in the lungs.

Before birth, the young animal derived its temperature in great part from the parent—*after* birth, this source of animal heat is cut off, and some contrivance becomes necessary to keep up the *proper temperature.* This contrivance we also behold in the lungs.

Before birth, the nutriment necessary for the support of the young animal is conveyed to it in the parent blood. After birth this supply is cut off, and some contrivance becomes necessary to furnish a supply of nutriment in some other way.

This contrivance we behold in the digestive apparatus.

The muscles, brain, and nervous system, with the organs of sense, are in the same condition immediately *before* as they are immediately *after* birth. The only difference is that, *before* birth, they were out of the reach of those impressing causes necessary to rouse them into activity—and we have already seen that of the actions or functions performed by those organs, life, that is,

the processes by which the animal is kept alive, or, in other words, nutrition and respiration, is entirely independent. With these, therefore, we have no further business; and I will only observe concerning them, that, since they entirely consist of phenomena which are the effects of certain proper and natural impressing causes, acting upon an impressible organism, these effects must be exactly *what they ought to be,* so long as the impressible organism is what it *ought to be*—and, since the impressible organism is the growth, product, or effect of nutrition and respiration, this impressible organism must be what it ought to be, so long as nutrition and respiration are carried *on* as they *ought to be.*

All this is true on the principle that definite causes will produce definite effects.

It follows, therefore, logically enough, that every one of the living actions—all sensation, motion, and what is called collectively health and strength, depend entirely upon nutrition and respiration.

Thus, then, it appears that while *before* birth, animal life consists, like the life of a vegetable, solely of the processes of nutrition, after birth, a certain other process is superadded, of which

vegetables are destitute, viz., the process of respiration. The life of vegetables is characterised by the *elimination* and *separation* of oxygen from the other constituents of their nourishment; while animal life (after birth) is distinguished by the continual *absorption into the system* of the oxygen of the air by the process of respiration. The use of this superadded process is to supply the animal with a proper *temperature,* and to set a *limit to its growth.* Hence it follows, and the most ordinary experience proves, that two conditions, and only two, are necessary to life after birth, viz., nutrition and respiration—or, in other words, which amount exactly to the same thing, *nutrition, temperature,* and WASTE—since the production of temperature and *waste* is the sole office of respiration.

But nutrition, *after* birth, goes on precisely the same as *before* birth. For the aliment on which all animals feed is blood. And the only difference is that, *after* birth, this aliment is prepared for the use of the organism, (out of the food which the animal eats) by the digestive apparatus. That is, the food which is eaten is converted, by the digestive apparatus, into blood by which the organism is then nourished, after birth, as it was

before birth. Whereas, *before* birth, blood was supplied to the young organism, by the parent, *ready prepared.*

Life after birth, then, as contradistinguished from life *before* birth, (vegetative life) is now reduced to a single consideration—the production of *temperature* and *waste*—and temperature and *waste* are the result of respiration. "In contradistinction to vegetable life," says Liebig, "the life of animals exhibits itself in the continual absorption of the oxygen of the air (respiration) and its combination with certain component parts of the animal body." And again: "the distinguishing character of vegetable life is the continued passage of matter from the state of motion to that of static equilibrium (nutrition.) While a plant lives we cannot perceive any cessation in its growth. * * * * In a word, no *waste* occurs in vegetables."

And temperature and waste, which *depend on respiration,* (together with nutrition) are, when properly performed, all that are necessary to health and strength, and the resistance of disease. *And every disease consists in some error either in the processes of nutrition or in those of waste.*

I will now endeavour to explain by what means

these all-important and necessary processes of temperature and *waste* are accomplished. In doing this, the momentous, unceasing, and not sufficiently-considered part which oxygen takes in the phenomena of animal life, and therefore in the phenomena of disease, will be perceived. And it will presently appear that this subject has a strong and direct reference to the treatment of disease by the Græfenberg or hydrotherapeutic method.

The greatest importance and most minute attention has always been awarded to the digestive organs, and the process of nutrition, as though human life, like the life of a vegetable, consisted of but *one* grand process, viz. nutrition, whereas it consists of *two*, viz. nutrition and *waste*, each of which is every bit as important as the other; or, if there be any difference, the process of waste is even *more* important than that of nutrition. Why is this exclusive attention given to the organs of nutrition, while the organs of *waste*, of which the skin is one of the most important, are almost wholly neglected?

CHAPTER II.

It is a fact perfectly well ascertained that the temperature of the blood of man is the same all over the globe—and in the temperate latitudes, in winter as in summer. Whether a man inhabit the arctic circles, or broil away his life under the vertical suns of Africa, the mean temperature of his blood is always the same, 99.5°. Nay, if he be put into an oven heated to a degree of heat sufficient to roast a joint of meat—it has been found that his temperature is not raised above the ordinary temperature of children—102.° Yet, "the animal body is a heated mass, which bears the same relation to surrounding objects as any other heated mass. It *receives* heat when the surrounding objects are hotter, it *loses* heat when they are colder, than itself."* We know too that the rapidity with which a heated body cools will be in proportion to the degree of coldness of the medium with which it is surrounded. The

* Liebig.

body of an Esquimaux, therefore, must cool, i. e. must give out heat to the surrounding atmosphere with infinitely greater rapidity than the body of an inhabitant of a warm climate. Yet the temperature of an Esquimaux's blood stands as high as that of the Hindu. These facts demonstrate that there must be some process going on within the body by means of which animal heat is reproduced as fast as it is consumed.

What are these means?

Again: under ordinary circumstances a man consumes about two pounds of solid food *daily*, or 730 pounds in one year. Yet at the end of the year, he is no heavier than at the beginning. With the insignificant variation of some two or three pounds, his weight remains the same.

In addition to the food, an ordinary man takes into his system *daily* 46,037 cubic inches or 15,661 French grains, that is, in whole numbers, two pounds by weight, of oxygen from the atmosphere. That is to say, there are added to his system, every year, 730 pounds of oxygen; which, added to the yearly amount of food, make a yearly addition of 1460 pounds of solid matter! Yet, at the end of the year he is no heavier than at the beginning.

Again, our senses demonstrate to us that there is given off from the body every day—in the shape of breath, perspiration, urine, and fœces—a very considerable amount of matter.

Yet, at the end of the year, as we are no heavier, so also are we *no lighter*.

These facts demonstrate that there are, going on in the body, two *opposing* processes—a process of *addition* exactly counterbalanced by a process of *subtraction*—or, in other words, alternate *waste and reproduction*. "The most ordinary experience shows, that at each moment of life, in the animal organism, a continued change of matter, more or less accelerated, is going on; that a part of the structure is *transformed* into unorganized matter, loses its condition of life, and must be again renewed."*

I have said that an ordinary man consumes two pounds of oxygen every day, and yet that he is, at the end of the day, no heavier. What then has become of this oxygen?

It has united with certain of the elements of the body, and having done so, it quits the body again, (in the form of what we call breath) carrying the elements of the body with which it has united, along with it.

* Liebig.

Two pounds of oxygen enter the body daily, unite with *two pounds* (or thereabouts) of the materials of the body itself, in company with which it quits the system again.

The place formerly occupied by the two pounds of material carried off by the oxygen, is supplied by the two pounds of fresh material daily taken into the system in the shape of food.

By this simple and beautiful contrivance the exact weight of the body is maintained—the worn out materials are carried off, and their place supplied by new materials.

The gross materials which we call food, recognisable by four out of the five senses, force themselves upon our notice, and arrest our attention, whenever the subject of life, health, and disease is under our consideration. But the intangible and invisible nature of oxygen causes it to escape our observation. And yet it is quite clear from the foregone remarks, that it is, to all intents and purposes, at least as important a consideration as food itself. Nay, if we remember the effects produced by a deprivation of oxygen, and of food, it is even *more* important. For we may live without food for some considerable time, whereas life cannot be protracted, without respi-

ration, beyond a few seconds. In amount too, the quantity of oxygen daily taken is equal to the quantity of food.

The atmospheric air is a mixture of oxygen and nitrogen. When we *inspire,* the inspired oxygen enters the blood; but the nitrogen inspired with the oxygen, is sent *out again* at the next *expiration.*

But certain of the elements of the body cannot be consumed by oxygen. These are expelled with, and constitute, the excretions—and *therefore* it was that I said two pounds of oxygen unite with two pounds of the materials of the body (not exactly) but "*thereabout.*"

So much of the two pounds as is not carried off in company with the oxygen in the form of breath, is carried away in the urine, fœces, and perspiration.

The manner in which the inspired oxygen gets into every part of the tissue of our organs is as follows. The blood, sent out by the left ventricle of the heart, to be distributed to every point of the body, cannot return to that ventricle to be distributed a second time, without first passing through the lungs. In its passage through the spongy texture of the lungs, the globules or

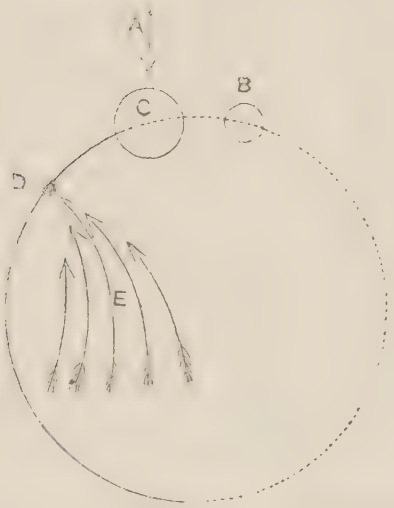
blood-discs, as they are sometimes called, which float in the blood, like shoals of microscopic fishes in a current of water, absorb oxygen from the air, with which the lungs are supplied by respiration.

The globules or blood-discs, having *loaded themselves with oxygen,* then proceed (borne onward by the current of the blood) like a swarm of bees laden with honey, from the lungs to the left ventricle of the heart, to be by it redistributed to every point of the body—of course carrying oxygen along with them, which they deposit at every point of the body as bees, when constructing their cells, deposit their wax at every point of the comb.

I wish particularly to impress upon the reader's mind the fact (undoubted and indisputable) that the black or venous blood, when circulated through the *arteries,* is an *inevitable poison*—producing *death* when the quantity is large, and *disease* when it is but small.

DIAGRAM, NO. I.

CIRCLE OF CIRCULATION.



EXPLANATION OF DIAGRAM.

B represents the left side of the heart. The dotted line represents the scarlet, nutritious, and highly oxydised blood sent out by the left ventricle of the heart, to be distributed by the arteries to every point of the body, carrying at once nutriment and oxygen (to which last it owes its scarlet colour) to all the tissues of our organs.

As the dotted line terminates (at the bottom of the circle) in a *black line,* so the arteries, having reached, in the substance of the tissues, the most microscopical degree of minuteness, terminate in veins—near which points of termination, the

blood, having parted with its oxygen and nutritious matter to the organism, assumes a black colour, and acquires pernicious, and even *deadly properties,* should it get into any of the *arteries* of the *vital* organs, as the brain, &c. It owes its black colour to the presence of carbon, which it has acquired in its progress through the ultimate tissues, and while it was circulating through the minute capillary* vessels. The commencement of the black line, therefore, at the bottom of the circle, shows at once, both the beginnings of veins and the terminations of arteries—the former being continuations of the latter, but altered in the structure of their coats. By tracing this black line (or vein carrying black blood) upwards to the left, it will be seen to enter c, the lungs. The moment it enters the lungs the line becomes dotted—that is, the blood becomes *scarlet* again. The arrow A represents oxygen coming into the lungs also, to meet the blood—which oxygen enters with the atmospheric air at every inspiration, and instantly unites with the black blood, converting it into scarlet. The dotted line (this scarlet blood) now proceeds to the starting point once more, that is, the left side of the heart, to

* From capillus, a hair.

be re-distributed, and to pursue the same course over again, with a new charge of nutriment and oxygen.

The black spot D represents the point at which the daily new nutritious matter (chyle) enters the black or venous blood *before* it reaches the lungs. The *flight of arrows* E represents the lacteal absorbents bringing the chyle from the bowels, (where it is produced out of the chyme emptied into the bowels from the stomach) and emptying themselves (through the thoracic duct) into the veins.

The unprofessional reader will now see clearly how the blood (or blood globules) is constantly acquiring new charges of oxygen, as well as new charges of nutritious matters—and also how these are distributed to every point of the animal tissues, by the myriads of minute arterial branches into which the larger branches are perpetually dividing, as they proceed from the heart towards the most intimate and deep-seated net-work of the body. The larger arteries branch out like the branches of a tree, branches from branches, till they become mere microscopical twigs—and the terminations of these arterial twigs form the beginning of veins—which *venous* twigs are per-

petually uniting, two or more into one, until the *whole* have been collected and united into no more than *seven,* called the primitive veins. He will also see that the blood, when once it has been sent out on its errand, by the left side of the heart, to be *despoiled* of its oxygen, *cannot* return to that side of the heart again until it has first passed *through the lungs* in order to be re-oxydised.

This provision is *absolutely essential to life.* For if, as sometimes *does happen, black blood* were to be returned into the left side of the heart (and it would necessarily be black if it did get there without passing through the lungs) this black blood would be sent by the left ventricle into the *arteries* of the brain and other vital organs, and immediate death would be inevitable. Death from drowning is *thus* produced. When a man is under water he cannot *breathe.* When, therefore, the black blood is brought into the lungs, there is *no oxygen to meet it;* and it proceeds to the left side of the heart, unoxydised and still black, and is, by it, sent to the brain, whose sensibility it immediately destroys.

It will be convenient here to quit the subject of circulation and respiration for a moment, and

recur to that of digestion. No sooner has the food entered the stomach than its elements, *set free* by the action of the gastric juice, are thrown into a state of motion similar to that of fermentation—the gastric juice acting towards the food a part *analogous* to that which the yeast acts towards the fermentable matters with which it is mingled. The elements, thus set free, enter into *new combinations* with each other. This process of *transformation* of the food, in consequence of the motion set up amongst its elements, goes on until it is finally *transformed* into blood.

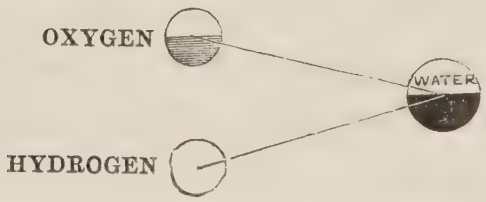
The nutritious elements of the blood, conveyed by the arteries to every point of the tissues of the body, become *fixed* in the organism by virtue of that law called *vital affinity*. And the nutritious elements, from a state of motion, are now reduced to a state of rest.

While the power which the vital affinity exerts over each element continues, it holds that element *fixed in* the organism. But in a short time the force of the vital affinity diminishes. The vital affinity becomes *weaker* than that which exists between the elements and oxygen. It is at this moment that the *stronger* overcomes the *weaker* affinity. The elements, before at rest, are thrown

again into a state of motion—quit the organism—enter into combination with oxygen—and, in the form of compounds of that element are carried out of the body.

I will endeavour to give to those who have not paid attention to these matters, a more defined notion of what is meant by *transformation,* or decomposition and recomposition. An atom of oxygen chemically combined with an atom of hydrogen—that is, held in union with it by chemical affinity—constitutes one atom of common *pure* water.

DIAGRAM, NO. II.

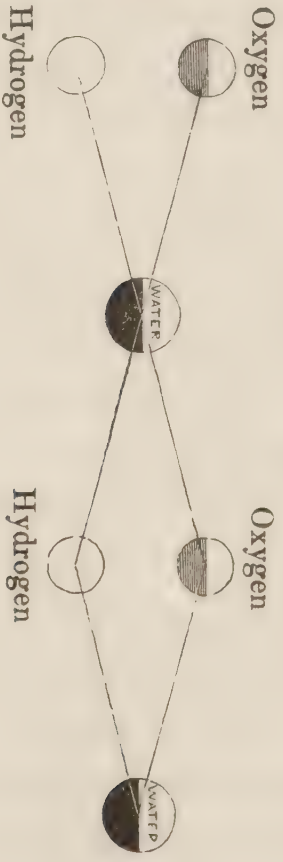


The above diagram represents these two elements uniting to form an atom of water. But now if this atom of water be submitted to chemical analysis, it will be again resolved, or *transformed* into its two constituents, oxygen and hydrogen, as represented in the following diagram, showing its elements again *set free.*

DIAGRAM, NO. III.



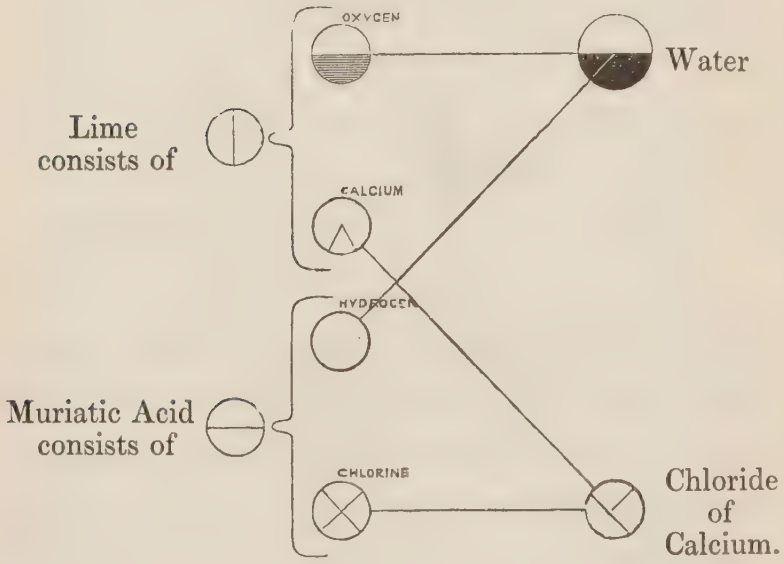
But if these elements, thus set free, be brought together again, and fired by the electric spark, they become chemically combined again, or *transformed* into water once more; and the diagram will now stand thus.



DIAGRAM, NO. IV.

Another instance a little more complex. There is a *form* of matter which we call lime, and another *form* of matter which we call muriatic acid. If these two be mixed together in water, the elements of which they are constituted are *set free,* and then unite again into *other forms.* Lime consists of oxygen and a metal called calcium; and muriatic acid consists of hydrogen and chlorine. The following diagram will show how these matters become transformed, when mixed together in water.

DIAGRAM, NO. V.



The four elements of which lime and muriatic consist have been *set free* and then *reunited* into

other forms. Lime and muriatic acid have been *transformed* into chloride of calcium, and water—having in these *new forms* acquired altogether *different properties and appearances.*

In fermentation similar transformations are effected. The elements of the fermentable matter first exist in that form which we call sweet-wort. After the addition of a ferment, however, these elements are set free, and then reunited into that *other form* which we call beer. And this beer may be made to undergo another set of transformations the result of which will be vinegar.

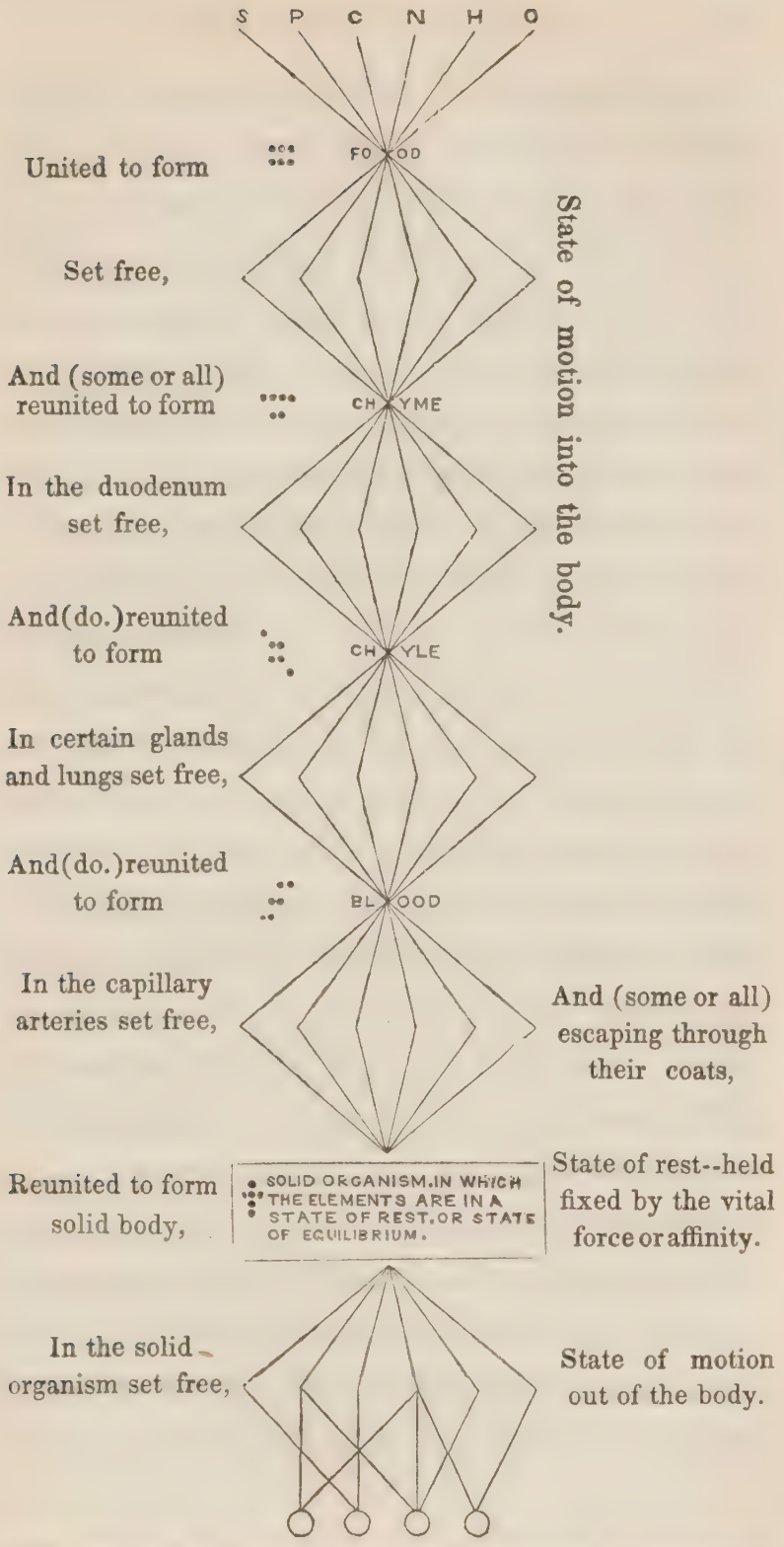
I will now attempt to convey a defined notion of the various transformations which our food undergoes, from the time it enters the mouth until it quits the body in the *form* of the various excretions, so that the reader may clearly understand what is meant by the *transformation, metamorphosis,* or CHANGE OF MATTER, upon which so greatly depend the health and strength both of body and mind.

The elements of which man's food is chiefly composed, chemical analysis proves to be oxygen, hydrogen, nitrogen, carbon, phosphorus, and sulphur, indicated in the following diagram by their initials only, O H N C P S. There are a few

others, as iron, sodium, chlorine, &c. But as I am merely *illustrating a principle,* and not teaching *exact details;* and am, moreover, anxious to make the diagrams as simple as possible, I shall only introduce these six elements, which will *illustrate the principle* of change of matter within the body just as clearly as if the *whole* were mentioned, and without cumbering the diagram with too many minutiæ. And I must here beg leave to repeat, once for all, that I am employed, in all my new diagrams, in *illustrating principles only*—not in describing minute details or exact results. These fall only within the province of the organic chemist, and may be found minutely detailed in Liebig's work.

It will be observed in the following diagram, that all the tissues of our body, as well solid as fluid, the chyme, the chyle, the blood, the solid organism (or flesh and bone) represented by the oblong square, are merely different arrangements, in different proportions, of the same six elements which constitute (chiefly) our food—sulphur, phosphorus, carbon, nitrogen, hydrogen, oxygen.

DIAGRAM, NO. VI.



And reunited to form the various excretions or compounds of oxygen, &c.

The cluster of six black dots placed at every reunion represents the same six elements with which the diagram starts. But although these elements are the same, it will be observed that every cluster differs from every other cluster in the mode in which the elements are *arranged*. It will be observed that the elements of the cluster representing chyme are differently arranged from all the others, and so on. And this difference of arrangement of their elements, with the different proportions, one to another, in which they are united, (amongst all bodies whose elements are the same) constitutes all the difference between one compound body and another—as for instance, between starch and sugar. The elements of starch and of sugar are the same. Alter the arrangement according to which the elements of starch are united, and you have sugar, instead of starch. On this principle large quantities of sugar were lately manufactured, in London, from the starch of potatoes.

The diagram also explains why the adult body always maintains one uniform size—because as fast as its elements are carried off by the motion of matter *out* of the body, their place is supplied by the motion of new matter *into* the body. How

children grow to be adults is also explained—because, in children, the vital force or affinity, which holds the elements fixed in the organism, is more active, than the *transforming force* of oxygen. And thus new matter *moves into* the body more rapidly than it is carried *out*. But, in adult life, these two motions become exactly *balanced*. Having attained the adult size, therefore, that size is preserved—and the body is now said to be in "static equilibrium," or in a state of mutual and equal resistance between two forces—the vital affinity, which constantly endeavours to *hold the elements fixed*, and the transforming force of oxygen, which constantly endeavours to overcome this resistance, and carry them off.

Now then, keeping the attention fixed upon every part of this diagram, and supposing the integrant particles constituting the solid organism to be actual *living* animalcules (which, remember, they are *not*)—and supposing each animalcule to remain strong and active for *six hours*, and then to begin to droop and be sickly, and to *die* at the expiration of six hours *more*—then it will be clear, that in order to keep the whole mass of animalcules (the whole solid organism) constantly *alive*, it will be necessary that the whole number of

animalcules be changed once in twelve hours, so that no one be suffered to remain in the body for more than that time. And it will be further obvious, that in order to keep the whole *active and strong,* the whole must be changed once in six hours. The integrant particles of the body cannot, in conventional language, be called animalcules perhaps, but it must be remembered that they are certainly *living* atoms, being endowed with vitality—that this vitality *quickly fades,* like insect life—and that, in a given time, it ceases altogether, and the particle dies—its vitality having become too weak to resist the action of oxygen.

Of course, I do not mean to say that six or twelve hours are the exact time. I only desire to show the *reason* why a *rapid change of matter* is of such vital importance to health and strength. *It keeps the body, as it were, perpetually* YOUNG—*the particles being removed, and their place supplied by* NEW, *before their vitality has had time to fade, and become flaccid and sickly.* It is by accelerating the *change of matter* that exercise, so proverbially beneficial, operates on the body.

It must be remembered that all the transformations shown in the diagram are effected under the

influence of the nerves and of the vital principle—and that the same decompositions and recompositions would not always, (though *some* of them would) be produced *out* of the body, even amongst the same elements. Every change within the body is modified and influenced by the nerves and vital principle. The body, therefore, is not to be looked upon as a mere chemical laboratory. The affinities between elements are *altered*, and perhaps some new ones acquired, but they are still strictly chemical notwithstanding.

Thus, from the moment that the food enters the body to that at which, having fulfilled its office in the system, it is expelled from it, its elements are in three conditions. First, it is in a state of motion, the result of the decompositions which it undergoes preparatory to its fixation in the organism. Then it is in a state of rest, held *fixed in the organism* by virtue of the vital affinity. Thirdly, it enters again into a state of motion, the result of the decomposition which the organism *itself* undergoes by virtue of the affinity of its elements for oxygen. At first, and for a short time, the vital affinity successfully resists the affinity between the elements and oxygen. Presently, however, the vital affinity fades, and loses

its hold upon the elements, which immediately enter into combination with oxygen, as above explained.

Thus, then, the living animal body is held in a state of perpetual balance or resistance between two forces, which Liebig designates "static equilibrium"—the vital force, which is continually seizing upon the nutritious elements of the blood and fixing them in the solid organism—and the chemical force of oxygen, which is perpetually seizing upon the elements of the solid organism, and carrying them out of the body.

The living processes, therefore, are a series of transformations — transformation of food into blood, of blood into solid organism—and of the solid organism into the materials of the breath, and other excrements. And the health and vigour of the body will always be in proportion to the energy with which these transformations are accomplished. In youth, these transformations go on with great rapidity—in consequence of which the temperature is somewhat higher. The temperature of man is 99.5°—of a child 102.2°. In consequence of this, too, there is in youth a higher degree of animal spirits, and a more abundant share of vital vigour. But, in youth,

the vital force is *stronger* than the chemical force of the inspired oxygen. The vegetative or nutritive life—those processes by which the nutritive particles of the blood are fixed in the organism, and the vital affinity which *holds them so fixed,* are more active than those processes by which the worn-out elements of the body are carried off. The processes by which the food is gradually transformed into the solid organism, are more rapid than those processes by which the solid organism is transformed into carbonic acid and water, and thrown out of the system. In a word, the increase or reproduction is more rapid than the waste—and increase of size or *growth* is the consequence. In the life of old age exactly the reverse occurs, and there is a gradual wasting and hardening of the several structures of the body. In adult life the two processes are *equal,* and there is neither increase nor waste.

"Viewed as an object of scientific research, animal life exhibits itself in a series of phenomena, the connection and recurrence of which are determined by the changes which the food, and the oxygen absorbed from the atmosphere, undergo in the organism under the influence of the vital force." And again: "*all vital activity* arises

from the mutual action of the oxygen of the atmosphere and the elements of the food"—that is, after the food has been transformed into blood, and has become fixed in, and a part of, the organism. And again: "Physiology has sufficiently decisive grounds for the opinion, *that every motion, every manifestation of force, is the result of a transformation of the structure, or of its substance; that every conception, every mental affection, is followed by changes in the chemical nature of the secreted fluids; that every thought, every sensation, is accompanied by a change in the composition of the substance of the brain.*"

These statements cannot fail strongly to impress the reader with the stupendous importance of oxygen in all that concerns life and health—and consequently disease also, which is but some error in the nature of some of these transformations. And not only the health of the body, but that of the mind, of the affections, of the intellect also, is equally influenced by the *transforming* part which oxygen plays in the animal economy.

It is, at least, fully of equal importance with that of the food.

"If the first condition of animal life," says Liebig, "be the assimilation of what is commonly

called nourishment, the second is a continued absorption of oxygen from the atmosphere." And again: "The first conditions of animal life are nutritious matters and *oxygen* introduced into the system. At every moment of his life man is taking oxygen into his system, by means of the organs of respiration; no pause is observable while life continues. What, it may be asked, has become of the enormous weight of oxygen thus introduced, in the course of a year, into the human system?

"This question may be answered satisfactorily; no part of this oxygen remains in the system; but it is given out again in the form of a compound of carbon or of hydrogen (that is, a compound of those elements with oxygen). The carbon and hydrogen of certain parts of the body have entered into combination with the oxygen introduced through the lungs and skin, and have been given out again in the forms of carbonic acid gas, and the vapour of water (breath). At every moment, with every expiration, certain quantities of its elements separate themselves from the animal organism, after having entered into combination, within the body, with the oxygen of the atmosphere."

It is here necessary to remind the general reader of that well-known chemical law of nature, that "in whatever way carbon may combine with oxygen, the act of combination *cannot* take place *without the disengagement of heat.* It is a matter of indifference whether the combination take place rapidly or slowly, at a high or at a low temperature; the amount of heat liberated is a constant quantity." When a log of wood (not containing any other combustible matters besides its own woody fibre) is burned to ashes, the heat which that burning log gives out is entirely the result of the combination of carbon with the oxygen of the atmosphere. The carbon of the wood uniting with the oxygen forms carbonic acid, which, mixed with the *vapour of water,* escapes up the chimney in the form of smoke.

That smoke consists essentially of the same materials as the animal's breath; and may, in strict propriety, be called the *breath* of the burning log.

We have just seen that the oxygen of the air, introduced into the system by the lungs, and carried by the blood-globules to every point of the animal tissues, quits the globules, and unites with certain materials of the solid organism.

Those materials are carbon and hydrogen.

Oxygen united with carbon forms carbonic acid—and, united with hydrogen, it forms the vapour of water—and the vapour of water and carbonic acid constitute essentially the animal breath. And thus it is, as I have before observed, that the oxygen, in company with the carbon and hydrogen of the body, quits the system in the form of breath.

But we have also just seen that whenever oxygen unites with carbon, no matter under what circumstances, *heat is necessarily given out,* and I gave an instance of this in a burning log of wood. And thus it is that ANIMAL HEAT is generated in the body, and as the smoke which arose from the burning wood might justly be called the *breath of the heated log,* so the human breath might be called in strict propriety, the *smoke* of the *heated body.*

The body is consumed by oxygen precisely as oxygen consumes an ignited log of wood—that is, in both instances, by combining with their carbon and hydrogen, and giving out *heat, the vapour of water,* and carbonic acid—which two latter pass out of the mouth, as the smoke, from the burning log, passes out of the chimney.

The most accurate experiments have proved that man, in the shape of food, consumes 13.9° oz. of carbon daily.

Now, "according to the experiments of Despretz, 1 oz. of carbon evolves, during its combustion (that is, its combination with oxygen), as much heat as would raise the temperature of 105 oz. of water at 32° (freezing point) to 167°, that is, (would increase its temperature) by 135°; in all, therefore, 105 times 135°=14207 degrees of heat. Consequently the 13.9° oz. of carbon which are daily converted (by combination with oxygen) into carbonic acid in the body of an adult, evolve 13.9 × 14207°= 197477.3° degrees of heat.

This amount of heat is sufficient to raise the temperature of 1 oz. of water by that number of degrees, or from 32° (freezing point) to 197509.3°; or to cause 136.8 lbs. of water at 32° to boil; or to heat 370 lbs. of water to 98.3° (the temperature of the human body); or to convert into vapour 24 lbs. of water at 98.3°."*

Since then the mere combination with oxygen of 13.9 oz. of carbon is sufficient to evolve this vast amount of heat—and since, indeed, it is

* Liebig.

impossible for these elements to combine in these quantities, *without* giving out this amount of heat —the mode in which the temperature of the body is daily sustained can no longer be a mystery.

But, *besides* this amount of heat obtained from carbon and oxygen, the animal temperature is also assisted by the combination of oxygen with hydrogen.

Now then it is clear—that, in order to maintain a constant supply of animal heat, and to keep the transformation of tissues (on which the health and strength of both body and mind, as well as the supply of animal heat, so entirely depend) in rapid activity—three elements are required, oxygen, hydrogen, and carbon. The oxygen we get chiefly from the atmospheric air—the carbon and hydrogen are supplied by the food. Hence it is plain, since animal heat, and the necessary transformation of tissues, can only be maintained by the combination of oxygen with carbon and hydrogen, that the quantity of food required, (from which alone the supply of carbon and hydrogen can be obtained) must be in a *direct proportion* to the quantity of *oxygen* taken into the system.

Now by far the principal means by which oxygen is introduced into the lungs is respiration. Hence it follows that the quantity of food required by the animal body, in any given time, must be in a *direct proportion* to the number of *respirations* performed *in the same given time.*

For, the capacity of the lungs to contain air being a *constant* quantity, the only way by which the quantity of oxygen introduced into the system can be made to vary, is by varying the number of respirations in a given time.

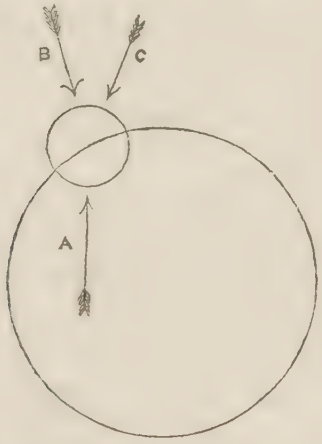
The fewer the respirations, the *less* oxygen—and the more frequent the respirations, the *more* oxygen, is introduced into the system.

But the quantity of blood which the lungs can contain at one time is *also a constant quantity*—and the quantity of oxygen which a given quantity of blood can absorb at one time is a *constant quantity likewise.* Hence the quantity of oxygen introduced into the system can only be increased consistently with health, by accelerating *respiration* and *circulation* SIMULTANEOUSLY—so that each *fresh* quantity of *oxygen* introduced into the lungs by each respiration, may meet there with a *fresh* quantity of blood (not yet saturated with oxygen) ready to absorb it.

Now the only means by which the respiration and circulation can be simultaneously accelerated is by EXERTING THE BODY.

I say consistently with health—for, if a greater quantity of oxygen be forced into the lungs than there is of blood-globules in the lungs to combine with it, and carry it off into the general system, the surplus oxygen will combine with the *substance of the lungs themselves,* and so produce deadly disease. A diagram will illustrate this.

DIAGRAM, NO. VII.



Let the larger circle represent the course of the blood, and the smaller circle the lungs. Let the *two* arrows (B C) represent oxygen coming into the lungs; and the single arrow (A) represent blood, also coming into the lungs. The single arrow A represents the amount of blood which

the lungs can hold at one time; and *each* of the two arrows B C represents one inspiration, or the amount of oxygen which is sufficient to saturate that one amount of blood, represented by the arrow A. Now, then, if the two amounts of oxygen (i. e. two inspirations) represented by the two arrows, be forced into the lungs in the *same period of time* during which the *one* amount of blood is also driven into the lungs, that one amount of blood, arrow A, will be saturated with *one* of the amounts of oxygen, represented by one of the two arrows, say arrow B; while the *other* amount of oxygen, represented by the arrow C, will be unable to combine with the already saturated blood-globules.

The surplus oxygen represented by arrow C will enter into combination with the substance of the lungs themselves, and thus produce unhealthy transformations, or, in other words, inflammation.

Can anything more beautifully, more satisfactorily, more plainly demonstrate the inestimable value, the absolute necessity of exercise in maintaining health and strength and resisting disease, than these considerations?*

* With relation to the great value of exercise, supported by a different line of argument, see my work on Life, Health, and Disease—article, exercise.

"Two animals which, in equal times, take up by means of the lungs and skin *unequal* quantities of oxygen, consume quantities of the same nourishment which are *unequal in the same ratio.*"*

"The consumption of oxygen in equal times may be expressed by the number of respirations; it is clear that, in the same individual, the quantity of nourishment required must vary with *the force and number of respirations.*

"A child, in whom the organs of respirations are naturally very active, requires food oftener than an adult, and bears hunger less easily. A bird,† deprived of food, dies on the *third day,* while a serpent, with its sluggish respiration, can live without food *three months and longer.*

"The number of respirations is smaller in a state of rest than during exercise or work. The quantity of food necessary in both conditions must vary in the *same ratio.*

"An excess of food is *incompatible* with *deficiency* of *inspired oxygen,* that is, with deficient

* Liebig.

† In birds respiration and circulation are exceedingly rapid. The mean velocity of the human pulse is 72, and of the respiration 18, in the minute; while the pulse of the pigeon beats, in the same time, 136 strokes, and he respires 34, consequently his temperature is very high, 107.6°.

exercise; just as violent exercise, which implies an increased supply of food, is imcompatible with weak digestive organs. In either case the health suffers."* And for the same reason, violent exercise is *incompatible* with deficiency of food. And this is one of the grand sources of disease among the *temperate and industrious poor.*

"At every inspiration a quantity of air enters (the lungs), the volume of which may be considered as *uniform;* but its weight (or density), and consequently that (weight or amount) of oxygen which it contains, is *not constant.* Air is expanded by heat, and contracted by cold, and therefore equal quantities of *hot and cold* air contain *unequal* weights of oxygen."*

Hence, although a man living in a warm atmosphere may draw the same number of inspirations as he does in a cold one, and may take into his lungs the same quantity of *air,* yet he does not take in the same amount of oxygen—for the air which he breathes in a warm atmosphere is (so to speak) *diluted with heat.*

Supposing, for a moment, one pint of *pure* brandy to be absolutely necessary to human life daily, then he who breathes a warm, that is, an

* Liebig.

expanded atmosphere, is in the same condition as he who, instead of getting daily his pint of brandy, only gets a pint of *brandy and water*. He still drinks the *measure of a pint*, but that pint measure does not contain so large a proportion of brandy—but a smaller quantity diffused over the *same space*.

How forcibly does this demonstrate the evils necessarily arising to the health from living too much in-doors, and breathing the air of warm apartments!

But from the foregone premises another important conclusion arises. It has been stated as a well-known and proven fact, that the temperature of the body is invariably the same, as well in the inhabitant of the polar regions as in that of the scorching tropics. Yet the human body gives out its heat, like any other heated mass, with a rapidity which is increased in a *direct ratio* to the degree of *cold with which it is surrounded*. For heat, like water, will find its level—and when a heated body is surrounded by, or in contact with, bodies colder than itself, the heated body will continually *give out* heat, which the cold body or bodies will *take in*, until *all* are of the same temperature. A much greater amount of heat,

therefore, must be given out by the body, in a given time, in the colder regions of the earth than in those of the warm south. And, in order to preserve the standard and uniform temperature, a much more rapid *generation* of heat must occur in the former than in the latter. Otherwise the temperature would be *lower* in the cold than in the warm latitude, which is not the fact. Hence it follows (and here it will be seen that the subject begins to bear upon the cold water treatment) that the more rapidly the body *is cooled* the more rapid is the generation of heat, and the more rapid also must be all those *transformations* of the tissues upon which, not only the *generation of heat,* but every kind of healthy vigor so entirely depends.

The lowering of the temperature (by whatever means) is equivalent to *a call* for a fresh supply of heat—and a call for more heat is equivalent to a call for more fuel (carbon and hydrogen)—and a *call* for more carbon and hydrogen is equivalent to a call for more food, since *food* is the source from which carbon and hydrogen are derived to the body. This want of more heat, or carbon and hydrogen, or *food,* nature makes *known* by that sensation or instinct which we call HUNGER.

"The self-regulating steam-engines, in which, to produce a uniform motion, the human intellect has shown the most admirable acuteness and sagacity, furnish no unapt image of what occurs in the animal body. Every one knows that in the tube which conveys the steam to the cylinder, where the piston-rod is to be raised, a stop-cock of peculiar construction is placed, through which all the steam must pass. By an arrangement connected with the regulating wheel, this stop-cock opens when the wheel moves slower, and closes more or less completely when the wheel moves faster than is required for a uniform motion. When it opens, more steam is admitted (more force), and the motion of the machine is accelerated. When it shuts, the steam is more or less cut off, the force acting on the piston-rod diminishes, the tension of the steam increases, and this tension is accumulated for subsequent use. The tension of the vapour, or force, so to speak, is produced *by change of matter*, by the combustion of coals in the fire-place (of food in the body). The *force* increases (the amount of steam generated, and its tension, increase) with the temperature in the fire-place, (temperature of the body), which depends on the supply of coals

and of air (of food and atmospheric oxygen). There are in these engines other arrangements, all intended for regulation. When the tension of steam in the boiler rises beyond a certain point, the passages for admission of air close themselves; the combustion is retarded, the supply of force (steam) is diminished. When the engine goes slower, more steam is admitted to the cylinder, its tension diminishes, the air passages are opened, and the cause of the disengagement of heat (production of force) increases. Another arrangement supplies the fire-place (the stomach) with coals (food) as they are wanted.

If we now *lower the temperature* of any part of the boiler (body), the tension within is diminished; this is immediately seen in the regulators of force (in the sensation of hunger), which act precisely as if we had removed from the boiler a certain quantity of steam (force). The regulators and the air passages open (hunger is felt), and the machine supplies itself with more coals (more food).

The body, in regard to the production of heat and of force, acts just like one of these machines. With the lowering of the external temperature, the respirations become deeper and more frequent;

oxygen is supplied in greater quantity and of greater density ; the change of matter is increased, and *more food* must be supplied, if the temperature of the body is to remain unchanged."*

"This great demand for carbon and hydrogen, but especially carbon, in order to keep up the supply of heat, and to give the necessary activity to all the living actions, accounts for the great appetites of the inhabitants of cold and mountainous regions—for the vast quantities of fat meat, alcohol, and even train oil, in which they can indulge with impunity. For these are all matters exceedingly *rich in carbon.* "Even when we consume *equal* weights of food in cold as in warm countries, infinite wisdom has so arranged, that the articles of food in different climates are most *unequal* in the quantity of carbon which they contain. The fruits on which the natives of the south prefer to feed do not, in the fresh state, contain more than 12 *per cent. of carbon,* while the bacon and train oil used by the inhabitants of the arctic regions contain from 66 *to* 80 *per cent. of carbon.*"*

Thus, then, it clearly happens that the more the body is *cooled*—the more heat that is abstracted

* Liebig.

from it—the more rapid becomes the *generation* of heat—the more keen the appetite—the more vigorous the digestive powers—the more rapid the transformation of tissues—and the more *energetic and exalted* the whole of the living actions, both of the body and mind.

And now, if the reader have understood the foregone reasoning, he will begin clearly to perceive in what manner the Græfenberg method of treatment acts upon the human body. He will perceive that, by repeatedly cooling the whole, or *various parts* of the body, according to the *nature and seat* of the disease, the energy of the living actions, inherent in the system itself, by which alone all diseases must be cured, are continually *exalted—healthy* transformations are substituted for unhealthy transformations—and the body is thus "*placed under the most favourable circumstances for resisting* (*or throwing off*) *disease.*" And thus, it will be perceived that the hydropathist proceeds strictly upon that golden principle laid down by all medical writers, (but *observed,* in practice, by none,) viz. "that the cure of all diseases must be effected by the *powers of the living system;* and that remedies are merely to be employed with the view of placing the body

under the *most favourable circumstances for resisting disease.*"*

If all diseases must be cured by the natural powers of the living system, surely the product of no rule-of-three sum arises more necessarily out of the premises, than does the following conclusion out of this position, viz. that the more the natural powers of the living system are healthily *exalted,* the greater must be their capacity for *resisting* or *throwing off* disease.

The living actions and the causes of disease are *antagonizing* powers. And clearly, by exalting or increasing the *one* power, you must exalt or increase its capacity for *resisting* the other.

Exercise is also an adjunct to the Græfenberg treatment.

Diet is *not,* but most certainly ought to be.

Well might one of the writers in the Lancet observe that "Liebig's work is calculated to give an entirely new complexion to the science of practical medicine!"

Thus, then, it will be perceived that oxygen, which plays so important a part in the other kingdoms of nature, organic and inorganic, plays a part equally important in the animal economy.

* Gregory.

"When the temperature sinks, the vital energy diminishes, (and the force of oxygen increases); when it again rises, the momentum of force in the living parts appears once more in all its original intensity. The production of force for mechanical purposes (bodily strength), and the temperature of the body must, consequently, bear a fixed relation to the *amount of oxygen* which can be absorbed in a given time by the animal body."* "And this great chemical agent," as Sir Humphrey Davy justly observes, "is at once necessary in all the processes of life, and in all those of decay, in which nature, as it were, takes again to herself those instruments, organs, and powers which had for a while been borrowed, and employed for the purpose or the wants of the living principle." And the act of respiration (whose chief office it is to introduce oxygen into the system) is, to the full, equally momentous to health and strength as the acts of eating and drinking. "Respiration," says Liebig, "is the falling weight, the bent spring, which keeps the clock in motion; the inspirations and expirations are the strokes of the pendulum which regulate it. In our ordinary time-pieces we know, with mathematical accuracy, the effect produced on their

* Liebig.

rate of going, by changes in the length of the pendulum, or in the *external temperature*. Few, however, have a clear conception of the influence of air and *temperature* on the *health of the human* body; and yet the research into the conditions necessary to keep it in the normal state *is not more difficult than in the case of a clock.*"

There is no one of the living actions in which oxygen is not more or less concerned; and one of the important offices of the saliva is to convey oxygen, in the shape of air bubbles, into the stomach during the act of eating.

"It is evident," continues Liebig, "that the supply of heat *lost by cooling* is effected by the mutual action of the elements of the food and the inspired oxygen, which unite together. To make use of a familiar, but not on that account a less just illustration, the animal body acts as a furnace, which we supply with fuel. It signifies nothing what intermediate forms food may assume, what changes it may undergo in the body, the last change is uniformly the conversion of its carbon into carbonic acid, and of its hydrogen into water; the unassimilated nitrogen of the food, along with the unburned or unoxydised carbon (the ashes of the furnace) is expelled in the urine, or in the

solid excrements. In order to keep up in the furnace a constant temperature, we must vary the supply of fuel according to the external temperature, that is, according to the supply of oxygen."

The supply of food to the stomach is exactly equivalent to the supply of fuel to the furnace of the steam engine. It is merely supplied for the purpose of being consumed, *for the sake of the effects which will be produced upon the engine (the body) by and during those processes by which it (the food) is itself destroyed.* As we obtain *light* by causing oil or wax to be consumed within the room where light is required, so we obtain *life* by causing food to be consumed within the body where *life* is required. When the light has gone out we can reproduce it; but we cannot reproduce life when it has become extinct. But this does not effect the analogy. For the question, is how to *maintain* life after it has been produced, and not how to produce it; and this is done by supplying the stomach with fresh food as we supply the lamp with fresh oil, and for the *same reason,* viz., that it may be, like the oil, consumed, *life* being the result of that consumption in the one instance, and *light* in the other.

In a burning log of wood there are certain

matters which are not combustible—that is, which do not unite with the oxygen of the atmosphere.

These constitute the *ashes of the furnace.*

So in the transformation of tissues within the body there are also certain incombustible matters; that is, which do not unite with the oxygen introduced into the system from the atmospheric air. These are the nitrogen, and small portions of carbon and hydrogen, which, combining with each other, and with the oxygen taken into the system as one of the elements of food, form the solid excrements.

These are the *ashes* of the *living* furnace.

"Had the animal food" (on which any carnivorous animal has been fed) "been burned in a furnace," (in a real furnace) says Liebig, "the change produced in it would only have differed *in the form of combination* assumed by the nitrogen, from that which it underwent in *the body of the animal.* The nitrogen would have appeared, with part of the carbon and hydrogen, as carbonate of ammonia, while the rest of the carbon and hydrogen would have formed carbonic acid and water (smoke or breath). The *incombustible* parts would have taken the form of *ashes,* and any part of the carbon *unconsumed,* from a deficiency

of oxygen, would have appeared as soot or lamp-black. *Now the solid excrements are nothing else than the incombustible, or imperfectly burned, parts of the food*"—that is, of the food (as he afterwards explains) *after it has fulfilled its office of becoming a constituent part of the body.* The excrements, therefore, are the ashes of the *burning animal body itself.*

"Almost everything effected," says Sir Humphrey Davy, "*by rapid combinations in combustion* (as in an ordinary furnace) may also be effected gradually by *the slow absorption of oxygen,*" as in the human body. When we throw a stream of cold air upon the fire by means of a pair of bellows, we produce the same effect as is produced by throwing cold water upon the body. In both cases we increase *the activity* with which oxygen combines with combustible matter. The fire, in both cases, burns brighter, a more rapid supply of fuel is required, and a greater amount of heat is generated.

"In the animal body," continues Liebig, "the food is the fuel; with a proper supply of oxygen we obtain the heat given out during its oxydation or combustion. In winter, when we take exercise in a cold atmosphere, and when consequently the

amount of inspired oxygen increases, the necessity for food containing carbon and hydrogen increases in the same ratio; and by gratifying the appetite thus excited, we obtain the *most efficient protection against the most piercing cold.*

"*Our clothing is merely an equivalent for a certain amount of food. The more warmly we are clothed the less urgent becomes the appetite for food,* because the *loss of heat by cooling,* and consequently the amount of heat to be supplied by food, is diminished." Again: "If we were to go naked, like certain savage tribes, or if in hunting or fishing we were exposed to the *same degree of cold* as the Samoyedes, we should be able, with ease, to consume ten pounds of flesh, and perhaps a dozen pounds of tallow candles into the bargain, daily, as warmly-clad travellers have related with astonishment of these people. We should then also be able to take the same quantity of brandy or train oil without bad effects, because the carbon and hydrogen of these substances (in which they abound) would only suffice to keep up the equilibrium between the external temperature and that of our bodies."

"No isolated fact," continues Liebig, "*apparently* opposed to this statement, can affect the

truth of this natural law." That is to say, no isolated fact can contravene the law that the quantity of food is regulated by the number of respirations, by the temperature of the air, *and by the amount of heat given off to the surrounding medium,* as, for instance, by frequent bathing. Of course it is a matter of indifference whether that medium be cold air *or cold water.*

From all that has been said, it is clear that *deficient oxygen* is equivalent to deficient *temperature,* and deficient *strength.* And, says Liebig, "deficient exercise and *diminished cooling* are equivalent to deficient oxygen."

Such are the influences of temperature—such are the influences *of the external application of cold to the human body.* It must be remembered that the language here held—the doctrines here promulgated—is the language of no obscure individual—of no individual who can possibly be interested in the promulgation of the doctrines here taught. It is the language of the greatest philosopher and chemist of the present day—the favourite of his prince—and, moreover, a physician. It must also be remembered, further, that the doctrines here taught are not the mere theories of a heated fancy. They have been

deduced by a beautiful chain of the most accurate reasoning, immediately founded on accumulated facts, the result of a multitude of the most laborious experiments, to enable him to perform which a detachment of soldiers was placed at Liebig's disposal.

It must be immediately clear to the reader that those who deride the external application of cold water, as a remedial agent, and affect to rank it among the ordinary delusions of the day, can only do so from an entire ignorance of everything which relates to the subject.

Physiology, the science of all others from which the art of healing diseases hoped to derive assistance, has rendered her no service. By the aid of her microscope, indeed, she has enabled us to count the number of terminal monads which go to make up an inch of muscular fibre; but on the nature of the living actions she has thrown scarcely a ray of light. With regard to these, she has occupied herself in spinning a succession of theoretical cobwebs, on each of which, in its turn, the practical art of healing has sought to erect an improved method of treatment. But these improved methods were introduced into practice by theory, only to be expelled by experi-

ence. But a new era is beginning to dawn; and organic chemistry, who indulges in no flights of fancy—*quantitative* organic chemistry, who deals only in facts, and does nothing without her scales, weights, and measures—has of late, speaking with the voice of Liebig, promised to rescue the curative science from the darkness and mystery in which centuries of dreaming have so fatally involved it. The airy nothings of physiology only serve, like the ignes fatui of the fens, to lead the passenger astray—but the products of chemical analysis are as fixed and unerring as the products of geometrical calculation. The words of an obscure individual, such as I am, may fall to the ground and perish like seeds on a barren rock—but the language of Liebig *must* live. The humble efforts which I now make may expire, and be forgotten, like one who has no friend—but the analyses of Liebig *cannot die.*

"The *cooling* of the body, by *whatever cause it may be produced,*" says Liebig, "increases the amount of food necessary. The mere exposure to the open air, in a carriage or on the deck of a ship, by increasing radiation and vaporization, increases the loss of heat, and compels us to eat more than usual. The same is true of those who

are accustomed to *drink large quantities of cold water*, which is given off at the temperature of the body 99.5°. It increases the appetite, and persons of weak constitutions find it necessary, by continued exercise, to supply to the system (by accelerated respiration) the oxygen required to restore the heat abstracted by the cold water." But increased appetite implies increased waste—and increased waste implies increased activity in all the transformations—and increased rapidity of transformation implies increased living energy, or an exalted condition of all the living actions—in one word, *that condition* which is most favorable for the throwing off disease.

"By the abstraction of heat, provided there be a full supply of food and free access of oxygen, the change of matter must be accelerated; and along with the augmented transformation, in a given time, of living tissues, *a greater amount of vital force must be rendered available for mechanical purposes*"*—that is, available for the purposes of bodily strength. "With the *external cooling*, the respiratory motions become stronger; in a lower temperature, more oxygen is conveyed to the blood; the *waste of matter increases;* and if the supply be not kept in equilibrium with this

* Liebig.

waste, by means of food, the temperature of the body gradually sinks." But if the supply of *food* increase, as the amount of *waste* increases, then, by a parity of reasoning, the generation of heat and production of force (animal strength) must increase also in a precisely similar ratio. "All experience proves," says Liebig, "that there is, in the organism, *only one source of mechanical power;* and this source is the conversion of living parts into lifeless, amorphous compounds (or *waste.*) Proceeding from this truth, *which is independent of all theory,* animal life may be viewed as determined by the mutual action of opposing forces; of which one class must be considered as causes of increase (or *supply* of matter) and the other as causes of diminution (or *waste* of matter). The cause of *waste* is the *chemical action of oxygen;* and its manifestation is dependent on *the abstraction of heat,* as well as on the expenditure of vital force for mechanical purposes (exercise).

"The act of waste of matter is called the change of matter;" (that is, the change of the several tissues into the several excretions, as breath, perspiration, &c., by which the old tissues are broken up and carried out of the body, to

make way for new); "it (that is, waste) occurs in consequence of the absorption of oxygen into the substance of the living parts. This absorption of oxygen occurs only when the resistance which the vital force of living parts opposes to the chemical action of the oxygen is *weaker* than that chemical action; and this *weaker* resistance is determined *by the abstraction of heat*, or by the expenditure in mechanical motions of the available force of living parts."

Here then we observe, first, that waste is "the only source of *mechanical power*" in the body—secondly, that "the *cause of waste* is the chemical action of oxygen"—thirdly, that the manifestation of this action is mainly "*dependent on the abstraction of heat.*" *Therefore the mechanical power of the body is mainly dependent on the abstraction of heat.*

The reader cannot have forgotten that the waste of the body is accomplished by that decomposition or transformation of tissues, effected by the combination of oxygen with their elements, (of the oxygen which is taken into the body by the lungs, and circulated through all the tissues, in the blood) by which *heat*, *force*, and the *excretions* are produced.

"In the animal body we recognise as the ultimate cause of *all force* only *one cause,* the chemical action which the elements of the food and the oxygen of the air mutually exert on each other."* But the mode in which this important matter of *waste* is produced by the agency of oxygen absorbed into the system by the process of respiration, as well as the purpose which the process of respiration serves in the animal economy, cannot be more clearly illustrated than by considering what takes place within the body of a starving man. "The whole process of respiration," says Liebig, "appears most clearly developed, when we consider the state of a man, or other animal, totally deprived of food.

"The first effect of starvation is the disappearance of fat, and this fat cannot be traced either in the urine, or in the scanty fœces. Its carbon and hydrogen have been given off through the skin and lungs in the form of oxydised products (carbonic acid and water—breath, and insensible perspiration); it is obvious that they have served to support respiration. In the case of a starving man, $32\frac{1}{2}$ ounces of oxygen enter the system daily (as usual) and are given out again in

* Liebig.

combination with a part of his body. Currie mentions the case of a man who was unable to swallow, and whose body lost one hundred pounds in weight during a month; and, according to Martell, (Trans. Linn. Soc. vol. 11, p. 411) a *fat* pig, overwhelmed in a slip of earth, lived one hundred and sixty days without food, and was found to have diminished in weight, in that time, more than one hundred and twenty pounds. The whole history of hybernating animals, and the well-established facts of the periodical accumulation, in various animals, of fat, which, at other periods, entirely disappears, prove that the oxygen, in the respiratory process, consumes without exception all such substances as are capable of entering into combination with it.

"In the progress of starvation, however, it is not only the fat which disappears, but also, by degrees, all such of the solids as are capable of being dissolved. In the wasted bodies of those who have suffered starvation, the muscles are shrunk, and unnaturally soft, and have lost their contractility; all those parts of the body which are capable of entering into the state of motion (transformation) have served to *protect the remainder of the frame* from the destructive influ-

ence of the atmosphere (atmospheric oxygen). Towards the end, the particles of the brain begin to undergo the process of oxydation (combination with oxygen), and delirium, mania, and death close the scene; that is to say, all resistance to the oxydising power of the atmospheric oxygen ceases, and the chemical process of eremacausis, or decay, commences, in which every part of the body, the bones excepted, *enters into combination with oxygen.* In all chronic diseases death is produced by the same cause, namely, by the *chemical action* of the atmosphere (that is, of oxygen). When those substances are *wanting* whose function is to support respiration; when the diseased organs are incapable of performing their proper function of producing these substances; *when they* have lost the power of transforming the food into that shape in which it may, by entering into combination with the oxygen of the air, protect the system from its influence, then, the substance of the organs themselves, the fat of the body, the substance of the muscles, the nerves, and the brain, are *unavoidably consumed.*

"The true cause of death in these cases is the respiratory process, that is, the action of the atmosphere (oxygen).

"The flame is extinguished, because the oil is consumed; and it is the oxygen of the air which has consumed it."

How brilliant is the light which these facts throw over the manner in which disease is produced! And how clearly does the following observation demonstrate the vast influence which a *very scanty diet* may sometimes, of itself, exert in the removal of certain diseases! "In many diseases substances are produced which are incapable of assimilation. By the mere *deprivation of food*, these substances are *removed* from the body *without leaving a trace behind.* Their elements have *entered into combination with the oxygen of the air*"—and so have been dismissed from the body in the form of breath! That is, when the food is so scanty as not to supply a sufficient quantity of the necessary elements for the oxygen to unite with, it unites with the elements of these substances, and carries them off, and thus prevents them from becoming causes of disease.

RECAPITULATION.

Thus, then, we learn that the only aliment on which every animal feeds is the *blood* which

circulates in its vessels. That this blood contains *two* principles especially and immediately concerned in the support of health and strength—the nutritious particles, whose office it is to *build the body up* by supplying *new* matter to its tissues—and oxygen, whose office it is to *pull the body down* by uniting with the elements of the *old* tissue, and carrying them out of the system.

We also learn that there are *two* sets of organs provided for the purpose of supplying these *two* principles to the blood—the *digestive* organs for supplying the *nutritious* elements out of the *food* which we eat—and the *lungs* for supplying the *oxygen* out of the *air* which we breathe.

The blood, in traversing the body, performs an irregularly shaped but entire circle, beginning and ending in the left side or ventricle of the heart.

At one point of this circle the nutritious particles formed in the stomach and bowels are emptied into the current of the blood by the lacteals. At another point of the circle are situated the lungs, through which the blood must pass in its way back to the starting point (the left side of the heart), in order to take in a fresh

supply of oxygen. And thus a fresh supply of nutritious particles, and a fresh supply of oxygen, are taken in by the blood during the performance of each successive revolution or circulation.

The blood is sent out by the left side of the heart to every point of the body, in order to nourish its tissues by *imparting to them its nutritious particles*—and in order, at the same time, to decompose the old and worn-out tissues *by imparting to them its oxygen*, which, uniting with their elements (under the influence of the nervous agency) carries them off, (in the form of new and lifeless compounds of oxygen) in the backward current of the blood, to which they impart a black color and poisonous property. But we have seen that the blood cannot get back to the left side of the heart to be sent out on a second voyage, until it has passed through the lungs. In its passage through the lungs it throws these new and hurtful compounds out of the body, in the form of breath—and takes in a fresh supply of free and pure oxygen. The blood, thus purified and reimpregnated with pure oxygen, then proceeds to its original starting point, the left side of the heart, to be again circulated in like manner, and to perform its offices anew.

We further learn that life is a state of continued resistance between two opposing forces—the vital force, which is perpetually building up the body by the superimposition of new particles of matter—and the chemical destructive force of oxygen, which is continually pulling it down, by entering into combination with its elements, and carrying them off. And, in adult life, perfect health depends upon these two forces being in exact equilibrium, so that neither preponderates over the other.

We learn that the manifestation of these forces exhibits itself in a double series of transformations—transformation of food into living tissue—and transformation of living tissue into lifeless amorphous compounds of oxygen, which are expelled from the body in the form of various excretions, as the breath, perspiration, &c.

We learn that animal heat and the *production force,* on which *solely depends* vigor of body and mind, vigor of digestion, secretion, absorption, &c., must ever and inevitably be in exact proportion to the activity with which these transformations are carried on.

And, finally, we learn that the activity and energy with which these transformations are

performed, are completely under the control of the *abstraction* of heat by the internal and external use of cold water.

We learn also how it happens that in winter, and cold climates, diseases of the *lungs* predominate—while in summer and in hot countries, diseases of the liver are most frequent. For, in cold countries, the air, being diluted with so small a quantity of heat, contains, in a corresponding degree, a very large amount of oxygen. And in delicate persons, and those in whom the chest is narrow, this large quantity of oxygen does not always meet with, in the lungs, a sufficient quantity of blood-globules to carry it all away into the system. Hence there is, in the lungs, a surplus of oxygen. And as oxygen cannot possibly exist in the system without combining with something or other, this surplus immediately attacks, unites with, and thus destroys or consumes the *substance of the lungs themselves.*

Speaking of the effect of a deficient supply of blood, from *weak digestion,* in cold climates, Liebig remarks: "In the colder climate the organs of respiration *themselves* would have been consumed in furnishing the necessary *resistance* to the action of atmospheric oxygen."

Diseases of the lungs, therefore, (as inflammation, coughs, &c.) are, as everybody knows, diseases more especially peculiar to winter—and they have for their cause *excess of oxygen.*

On the other hand, diseases of the *liver* are peculiar to *hot* weather and *hot* countries, as everybody knows *also.* In hot weather, the air being largely diluted with heat, there is a *deficiency* of oxygen. But a *deficiency* of oxygen necessarily implies an *excess of carbon* — of carbon which remains *unconsumed* owing to a want of sufficient oxygen to *consume* it. Now there is in the body an organ whose office it is to convert whatever carbon may remain in the body *unconsumed* (for there is always *some*, even in perfect health) *into bile.*

This organ is the liver.

In *hot* weather, therefore, the liver becomes gorged with an *excess of carbon.* This *excess of carbon* becomes a *disturbing cause*—and gives rise to *disease* of the liver, *excessive* secretion of *bile*, &c. &c.

Disease of the liver, therefore, is more especially peculiar to *hot* weather—and has for its cause *excess of carbon.*

We also learn why butter and fat promote an

excessive secretion of bile, as popular experience has long discovered. They consist almost entirely of carbon and hydrogen. And the *excess* of carbon thus introduced into the blood is again removed by conversion into bile. Thus excess of carbon implies excess of bile.

CHAPTER III.

From the foregone observations, it will appear that *health* consists in that state of the body in which the transformations of food into living tissue bear the natural proportion (as it regards their activity) to the activity of the transformations of living tissue into lifeless amorphous compounds of oxygen—in other words, when the *conservative* vital force offers the proper amount of resistance to the *destructive* force of oxygen—or, in language simpler still, when the *supply* is in due proportion to the *waste*.

Adult life is a state of *resistance* between two antagonizing forces—a *conservative* and a *destructive* force. And an adult animal is *then* in health, when these two forces exactly counterbalance each other.

"That condition of the body which is called health includes the conception of an equilibrium among all the causes of waste and supply; and thus animal life is recognised as the mutual action

of both; and appears as an alternating *destruction,* and *restoration of the state of equilibrium.*"* And whatever increases the natural appetite—whatever increases the capacity of the system for food—increases the power of the living principle or vital force.

DISEASE.

Disease is a *disturbance* of this equilibrium or balance. Consequently, *whatever causes* this disturbance is a *cause* of disease.

But the vital force offers a perpetual resistance to *all causes of disturbance.*

When this resistance is *stronger* than the cause of disturbance, disease does not occur. But when the *resistance* offered by the vital force is *weaker* than the disturbing cause, then disease ensues.

That condition, in which this resistance *entirely ceases,* is called *death.*

In making an issue in any part of the body for surgical purposes, the caustic substance used to make the issue is a *disturbing* cause which is stronger than the vital resistance offered by the part to which it is applied—and that form of disease which we call a *sore* is the consequence.

* Liebig.

When the caustic—that is, the *disturbing cause* is *removed, then* the *resisting* power of the vital force *manifests* itself—and the sore *heals.*

In order, therefore, to keep the *sore from healing* some disturbing cause must be set up which shall be *permanent,* and whose *disturbing power* shall also be *stronger* than the *resisting* power of the vital force. For this purpose a pea is put into the sore and fixed there with a bandage.

The sore continues to discharge, but it does *not heal.*

The *continual* discharge is a manifestation of the *continual* effort which the vital force is making to heal the sore—a manifestation of its continual *resistance* to the disturbing cause, the pea—which it continually endeavours to remove—and it *would* be removed, were it not for the bandage. When the bandage is removed, however, then the *resisting cause* (the vital force) obtains the ascendancy over the *disturbing cause,* viz. the pea—which is now loosened and washed away with the discharge —and the *sore heals.*

This illustrates very well the resistance which the vital force offers *to all disturbing causes*—and also the manner in which disturbing causes may

operate on the body whenever their power is *stronger* than the *resisting power* of the vital force.

"The action of a cause of disease exhibits itself in the disturbance of the proportion between *waste and supply* which is proper to each period of life. In medicine, every abnormal condition of *supply or of waste,* in *all* parts, or in a *single part* of the body, is called disease."*

When the caustic is applied to the skin for the purpose of making an issue, the chemical action of the caustic becomes *an additional* destructive cause—or additional cause of waste—and thus destroys the balance or equilibrium between waste and supply. When the caustic is removed, the vital or conservative force restores the equilibrium, and the sore is healed.

The oxygen of the air, taken in by the lungs, and circulated by the blood, is, to *every point* of the body, exactly what the caustic is to that particular part to which it is applied. And as the vital force, in the case of the issue, renews what the caustic had destroyed—so, throughout the whole system, what is destroyed by the oxygen is renewed by the vital force.

* Liebig.

In the case of the caustic, the *destruction* of the equilibrium between waste and supply, and its *restoration* by the vital force, is a *slow and partial* process. In the case of the oxygen it is universal, rapid, and continual.

When the resisting power of the vital conservative force, throughout the entire body, becomes permanently *diminished,* it is obvious that the *destructive* power of oxygen is *increased* in a corresponding ratio. And as the amount of heat liberated in the body depends upon the activity with which the destructive transformations, effected by the oxygen, are carried on, it follows that, when the conservative resistance is permanently diminished, there will be a corresponding augmentation of animal heat. And a preternatural augmentation of temperature becomes itself an additional *disturbing cause.*

This state of things is called *fever.*

"According as a single organ or a system of organs is affected, the change of matter extends to one part alone, or to the whole affected system.

"Should there be formed, in the diseased parts, in consequence of the change of matter, from the elements of the blood or of the tissue, new products, which the neighbouring parts can-

not employ for their own vital functions—should the surrounding parts, moreover, be unable to convey these products to other parts where they may undergo transformation, then these new products will suffer, at the place where they have been formed, a process of decomposition analogous to fermentation or putrefaction."

In this manner are formed tumors, abscesses, open sores, &c. &c.

In consequence, too, of the *too energetic* action of oxygen, an abnormal or morbid transformation goes on, from which there result *abnormal*, or *morbid* products, which may either *pass out* of the body and *appear in the excretions*—or the resisting energy of the vital force may make a *new outlet*, as in the Græfenberg crisis, for the express purpose of expelling these matters, as in the case of certain abscesses, (the pustules of small-pox for instance) and other eruptive diseases. Or, for *want of sufficient energy in the vital force*, they may remain in the system and become permanent *causes of disturbance*, that is, of disease.

One word concerning the nerves, and that word shall be Liebig's.

"The nerves which accomplish the voluntary and involuntary motions in the body, are, accord-

ing to the preceding exposition, not the producers, but only the conductors, of the vital force; they propagate motion, and behave towards other causes of motion, which, in their manifestations, are analogous to the vital force, towards a current of electricity for example, in a precisely analogous manner. They permit the current to traverse them, and present, as conductors of electricity, all the phenomena which they exhibit as conductors of the vital force."

"A diseased condition once established," continues Liebig, "in any part of the body, *cannot* be made to disappear by the *chemical action of any remedy*." "The art of the physician consists in a knowledge of the means which enable him to exercise an influence on the *duration* of the disease; and in the removal of all disturbing causes, the action of which strengthens or increases that of the actual cause of disease."

Now, since "*the chemical action of a remedy*" cannot exercise any influence over the *duration* of a disease, it is perfectly obvious that the *duration* of disease can only be influenced—can only be cut short—by exalting the *resisting energy* of the vital force—by augmenting and exalting the energy of *that force*, one of whose *prime offices* in

the economy of life is to *resist the aggression of disease!* And it has been proved, in the preceding pages, over and over again, that this exaltation of the vital energies can be readily and most effectually accomplished by the judicious application of cold.

"Practical medicine," says Liebig, "in many diseases, makes use of cold in a *highly rational* manner, as a means of *exalting and accelerating* the change of matter."

What sort of value is that which the hydropathist must set upon the sneers and gibes—the tiny witticisms of small philosophers—while he has *one such man* as Liebig on his side?

CHAPTER IV.

We have now taken a concise but general view of the nature of life, health, and disease, and of the great *general principles* which regulate the practice of the hydropathist. And we have seen that these latter—the principles of hydropathy—are in strict accordance with all that is known—with all that the most modern *medical philosophy itself* assumes as *true* with regard to the *former*.

In a work of such limited extent as this, it was impossible for me to enter into a lengthened detail of the various arguments, facts, and experiments, on which the doctrines herein explained are founded. But they may all be seen, fully expounded, in the "Organic Chemistry applied to Physiology and Pathology," the great and recent work of Dr. Justus Liebig, professor in the university of Giessen—a *name* which stands at the very head of the ranks of modern scientific philosophers, and a *work* which has already excited the admiration of all the learned societies of Europe.

What I have already said applies more particularly to the application of cold water *generally*, as a remedy exerting a powerful and controlling influence over diseased actions.

I shall now enter somewhat more *particularly* into the several modes of *applying* cold water, and the other *details* of treatment adopted by Priessnitz, and the several effects which are thus produced.

What a series of the most elaborate experiments, and a vast amount of the most scientific learning, have taught Liebig—strong powers of *general reasoning*, acute observation, and long experience, have taught Priessnitz.

The *two* have arrived at the *same* goal by *different* roads.

Priessnitz cannot give to his knowledge a scientific expression. But when Priessnitz declares (as he does) that the application of cold water cures diseases by *strengthening the general health and fortifying the system*—and when Liebig declares (as he does) that the *abstraction of heat* cures diseases by *exalting and accelerating the transformation of tissues*—the *two* do but give expression to the *same* fact in *different* language.

When Priessnitz declares that cold water has a

tendency to bring "*bad stuff*" out of the system —and when Liebig declares that it promotes the union of certain matters with oxygen, by which they are *carried out of the system,* and which matters, if not so carried out, become causes of disease—the *two* do but give *different forms* of expression to the *same fact.* And the *same* general reasoning on the nature of things has taught Priessnitz, as it has taught medical philosophers, that "all diseases must be cured by the inherent energies of the living system itself. Neither *book* learning, nor *scientific* learning are necessary to convince any thinking man of this general truth.

With regard to the application of cold water to the *whole of the body,* Liebig remarks: "Let us now suppose that heat is abstracted from the *whole surface* of the body; in this case the whole action of the oxygen will be directed to the skin, and in a short time the change of matter must increase throughout the body. Fat, *and all such matters as are capable of combining with oxygen, which is brought to them in larger quantity than usual, will be expelled from the body in the form of oxydised compounds.*"

If, therefore, the body contain any *morbific*

matters, these will be *expelled* in the form of oxydised compounds.

The same effects, he has before told us, may sometimes be accomplished by using a very *scanty diet.*

OF THE PARTIAL APPLICATION OF COLD WATER.

But Priessnitz's treatment by *no means* confines itself to the *general* application of cold water. Its *partial* application is much more frequently adopted—as, for instance, the sitz bath, the foot bath, the head bath, the arm bath, the face bath, &c. &c. The effects, moreover, of the treatment are wonderfully varied by the *duration of time* that the patient is directed to *remain* in these baths. The duration of the sitz bath varies from twenty minutes to two hours and half. And the effects thus obtained vary, not only in *amount,* but also in *kind.*

How do these *partial* applications of cold water act on the system? They act by *determining* the force of oxygen from *one* part to *another.* They produce *all* the effects both of *bleeding* and *blistering*—except the pain.

"In certain cases," says Liebig, "medicine (that is, the *science* of medicine) removes diseased

conditions, by exciting in the vicinity of the diseased part, or in any convenient situation, an artificial diseased state (as by blisters, sinapisms, (that is, mustard plasters) or setons); thus *diminishing*, by means of artificial disturbance, the *resistance* offered by the vital force to the external causes of change in these parts. In cases of a different kind, where artificial external disturbance (blisters, &c.) produces no effect, the physician *diminishes*, by blood-letting, the *number* of the *carriers of oxygen*, (the blood-globules) and, by this means, alters the conditions of the change of matter." Now in both these cases, it will be observed that the good effects produced by bleeding and blistering are brought about by diminishing the chemical force of oxygen in the diseased part. In blood-letting, the chemical force of oxygen is diminished by carrying out of the system a portion of oxygen along with the blood withdrawn, and thus diminishing the quantity of oxygen in the whole body.

In blistering, the same effect is produced by diverting the force of oxygen from the diseased part to some other part of the body, by exciting a temporary disease in that other part.

In the diseased part, the *resistance* offered by

the vital force to the chemical force of oxygen is *weaker* than that chemical force. By lowering the resistance of the vital force in some *other* part of the body (by means of a blister) until the *resistance* in that other part becomes *still weaker* than in the diseased part, *then* the chemical force of oxygen is *diverted* from the diseased part, and attacks that other part where it meets with a *still less resistance*. This brings the vital resistance, in the diseased part, once more into equilibrium with the *now diminished* force of oxygen in the diseased part—which equilibrium of forces constitutes the state of health.

Now let us suppose an inflammation to exist in some organ in the upper half of the body—in the brain or lungs. In whichever organ it be, in *that organ* the force of oxygen is *predominant* over the *vital force*, and the equilibrium of the two forces is thus destroyed.

Now by plunging the *lower half* of the body into cold water, and keeping it there until the *resistance* offered by the vital force to the force of oxygen becomes *still weaker* than it is in the *diseased part*, the force of oxygen is diverted from the *diseased* part, in order to attack those *other parts* in which it meets the *least resistance*. And

thus, in the diseased parts, the *equilibrium* between the two forces is *restored*—which constitutes the state of health.

Wherever the water is applied great *redness* is produced, which proves beyond question that there is a great determination of blood *to that part*, which must have been brought from the other parts of the body, from the *diseased* parts, amongst others.

"If," says Liebig, "we surround a *part* of the body with ice or snow, while other parts are left in the natural state, there occurs, more or less quickly, in consequence of the loss of heat, an accelerated change of matter in the *cooled part*.

"The resistance of the living tissues to the action of oxygen is *weaker* at the *cooled* part than in the *other* parts; and this, in its effects, is equivalent to an *increase of resistance* in these other parts—the *whole action* of the inspired oxygen is *exerted on the cooled part*.

"In the cooled part of the body, the living tissues offer a *less resistance* to the chemical action of the inspired oxygen; the power of the oxygen to unite with the elements of the tissues is, at this part, exalted.

"In the cooled part, the change of matter, and

with it the disengagement of heat, *increases;* while, in the other parts, the change of matter and liberation of heat *decrease.*"

And thus, by the judicious use of cold water alone, *all the good* effects of blistering and bleeding are most readily and certainly produced, without any of the *bad effects.* The *bad effects* of repeated bleeding, in certain diseases, are well known to medical men. We know, perfectly well, that it often happens that a patient is saved, by *bleeding,* from dying of an *inflammation,* only that he may die of a *dropsy.* We all know, perfectly well, that a patient is often saved by *bleeding* from dying of hæmorrhage from the lungs, only that he may die the sooner of *consumption.*

The foregoing explanation of the mode in which the *partial* application of cold water operates on the body, will clearly show how imperatively necessary to the hydropathist it is that he should be thoroughly conversant with all the various modes adopted by medical men in order to ascertain the nature and seat of the disorder, as well as with those which serve to distinguish one disease from another. Scientific knowledge—physiology, anatomy, and morbid anatomy, with the symptoms which characterize

and distinguish particular diseases, and indicate the particular organs which are effected, together with their situation, are not less necessary to the hydropathist than to the ordinary practitioner.

The only difference between the ordinary practitioner and the hydropathist is, that the latter has discovered a *new remedy*. And obviously it is as necessary to know how, when, where, and in what dose, to apply the *new* remedy as the old. And the same kind and amount of knowledge is equally necessary. For an over-dose, or misapplication of the *new* remedy, is as deadly as an over-dose or misapplication of the *old*.

And here it must be *distinctly and permanently remembered, first,* that the hydropathist does *not* pretend that his remedy is applicable to *all* diseases, nor to all states of the *same* disease. A thorough knowledge of the nature of the several diseases, therefore, to which the human body is liable—to know how to distinguish one from another—to know when the same disease is produced by this cause or by that—which is the same thing as to know when the *same* disease is *curable* and when it is *not curable*—to know in what particular *stage* the disease is when the patient applies for advice—to know whether the

symptoms of which he complains are produced by *disorganization* of parts, or whether they are merely *functional*, and only depending on morbid sensibility of the nervous centres—all this, and much more, is clearly a necessary part of the hydropathist's education. For, if he do not possess this knowledge, he will not only do much mischief, but will be continually receiving patients, and vainly submitting them to a long, tedious, and expensive process, when he ought to have known at first that his case was *not* one which could be benefitted by the hydrotherapeutic treatment. For instance, in the case of dropsy, if the disorder have arisen in consequence of mere general debility arising simply from functional derangement, the case is one which will certainly be cured by the water treatment. But if it have arisen in consequence of thoracic adhesions, as between the pericardium and pleura—or in consequence of tuberculated liver—or from the pressure of any internal tumour resting upon any of the large veins, so as to prevent the return of blood towards the heart—to submit *such* a case of dropsy to the water cure is a culpable injustice and most gross cruelty.

So, again, in epilepsy and paralysis—if these

affections have arisen in consequence of some irremovable mechanical agent, as the growth of a spicula of bone, nothing can cure them. But if they have been produced by a clot of blood, which has oozed from some small ruptured vessel, then, I say, and repeat *hardily*, because I have *seen* it, *such cases are curable* by the water treatment united to a *severe course* of abridged diet—or, as I shall call it, *compulsory absorption.*

Secondly, it must also be *distinctly and permanently remembered* that the hydropathic remedy, so seemingly simple, is not *unique and one*, but *several*—and that effects *diametrically opposite* to each other may be produced by it.

To all this it may be replied that *Priessnitz* is not a scientific man. True—but it must be recollected, in the case of Priessnitz, that a long experience of twenty years and in a vast multitude of cases, coupled with great attention, perseverance, and an extraordinary acuteness of observation, have, to a considerable extent, supplied the place of scientific knowledge. But no rational man can doubt, that the possession of scientific knowledge would enable even Priessnitz to be much oftener successful than he is, and would lessen the number of his failures. Certainly it would

prevent his taking in and submitting to a tedious treatment many cases which such knowledge would have taught him at first were perfectly hopeless. There are many such cases in the establishment at this moment. For instance, there is a case of anchylosed joint. A gentleman, while hunting, fell from his horse and hurt his elbow. In the course of time the joint became *quite stiff*, when he came under the care of Priessnitz. He has been at Græfenberg already for five or six months. But if he were to remain there all his life, his joint would remain as stiff as it is at this moment. For the olecranon process is snapped off, the internal structure of the joint broken up, and the whole glued and soldered together, by a deposition of bony matter, into one solid mass. This gentleman is disappointed, and of course dissatisfied—and, in this way, much chagrin and ill-feeling is engendered, which might have been avoided; and that reproach is thrown upon the *practice*, which, in strict justice, is only due to the *practitioner*.

Scientific knowledge, therefore, and a clear conception and perfect acquaintance with the *mode* in which the hydropathic treatment operates upon the system—the PRINCIPLES on which it

proceeds—are imperatively necessary to the hydropathist, if he would abstain from mischief, and practise successfully. And I foresee that much evil will at first result, and many a life be sacrificed, from the *apparent* simplicity and innocence (for they are but *apparent*) of the remedy; inducing persons to practise both on themselves and others (to the injury of both), without the knowledge necessary to do so with success. And this is an evil which will continue to occur to many, until sharp experience shall have pricked their fingers, and admonished them that, as all is not gold which glitters, so neither is all *easy* which does *not seem* difficult.

The modes in which water is applied, according to the nature, severity, and situation of the disease—according to the particular effects, and *degree* of effect, and according to the nature and strength of the constitution—are exceedingly various. There is the leintuch, the sitz bath, the abgeschrechtes or tepid bath, the cold bath, the abreibung, the vannah, the arm bath, the foot bath, the coph bath, the various umschlags, the eye bath, the face bath, the douche—the internal application of cold water by *drinking*, and by

enemata or lavement. And different effects, and upon different parts of the body, are produced accordingly as one or other, or several conjointly, of these modes are practised.

To enter minutely into the various uses of these several modes of employing the remedy would be inconsistent with the limits and scope of this work.

I have already explained their more prominent effects under the heads of *partial application* and *general* application. And I have only space to glance rapidly at one or two of them.

The leintuch, which is a wet sheet applied in a peculiar manner, produces two *diametrically opposite* effects, accordingly as it is used. If it be changed repeatedly as fast as the patient becomes warm, as, for instance, in cases of fever, almost any amount of heat may be *abstracted* slowly and gradually from the body. But if the patient remain for half an hour or an hour, the most delicious sensation of warmth, and a gentle breathing perspiration, are produced; while all pains and uneasiness is removed. It produces all the soothing influence upon the *entire* system, which is produced by a *warm poultice* on an *inflamed surface.*

The umschlag does for any *part* of the body what the leintuch does for the whole.

The abreibung is a more convenient mode of producing the same effects as are achieved by the cold bath.

The vannah is a bath by which the effects of the cold bath are rendered more intense and permanent.

But the *most intense impression* which can be made by the application of cold water is accomplished by the douche—and there must be in the system a *very considerable amount of vital force* to enable the patient to bear this mode of application. For, beyond doubt, a misapplication of the douche may so far lower the vital resistance as to make reaction exceedingly difficult or even impossible. It may knock the patient so violently down as to make it difficult for him to get up again—thus giving rise to dropsical swellings o the legs and feet, venous congestion, piles, varicose veins, and other symptoms indicative of deficient vital action. It sometimes produces the most extraordinary effects, as weeping, laughing, trembling, &c. In its proper place, however, it exercises a most powerful influence over disease; and seems to exert an especial impression upon

the absorbents. I have seen tumors of long standing most rapidly absorbed and disappear, under the use of the douche. This effect in removing tumors is easily enough explained when we consider the great influence of cold in promoting the *waste* of the body—as we have already seen.

The internal use of cold water by drinking is another mode which demands some remark. The distension of the stomach with a large quantity of cold water at one time, is what no *sensible* hydropathist—none who understands the *principles* of hydropathy, and the nature and structure of the human body—*will ever practise.* Such practice is fully capable of producing sudden death. Rupture of the stomach is a possible and a *fatal* accident—and the *sudden abstraction* of so large an amount of *vital* heat, immediately from the *vital* organs, may produce very sudden and very serious injury—and HAS produced it. Nor does Priessnitz *ever* resort to this practice, except under very urgent and extraordinary circumstances. Ten or twelve tumblers of cold water, *distributed over the whole day,* is all that, under ordinary circumstances, he *ever* orders. Thus taken, it acts as a most elegant and efficient *tonic,* increas-

ing the appetite, promoting digestion, and, in common with the general treatment, gradually abstracting morbid heat from the stomach, bowels, and rest of the system. It certainly acts too as a resolvent—dissolving morbid matters, not only in the stomach, and thus facilitating their passage into the bowels, thence to be expelled from the body—but it also dissolves certain morbific matters in the blood (into which it is absorbed by the veins) reducing their particles to the ultimate degree of minute subdivision, and thus facilitating their combination with oxygen, and consequently their expulsion from the body.

But there is another view which I take of the mode in which water introduced into the stomach may produce its good effects—for that it *does* produce good effects is perfectly unquestionable. And although I can bring no *facts* in absolute proof of the truth of this view, yet there are several *facts* which (as it appears to me) give it a high degree of vraisemblance.

Of the great importance of oxygen to the welfare of the system we have ample proof. We know that a most elaborate set of organs (the glottis, the trachea, and the lungs) have been contrived for the sole purpose of importing it into

the system. We know also that the *skin* absorbs oxygen from the air. And we know also that when nature has an important object to achieve she makes everything contribute a share towards achieving *that object*, in addition to their ordinary functions. Thus, the saliva answers the double purpose of moistening the food, and *also* of importing oxygen into the stomach. The skin too answers the *double* purpose of absorbing oxygen, and of extricating carbon, hydrogen, and nitrogen.

It is not wonderful, then, that she should let slip no opportunity of introducing oxygen, so important to the vital functions, into the system. Nor is it wonderful that she should make the stomach answer the *double purpose* of *taking in* oxygen while it *gives out* gastric juice—nor that she should make the water (like the saliva) which we swallow with our meals, answer the *double purpose* of *yielding* oxygen while it moistens our food.

The air which we breathe is composed of oxygen and nitrogen. The lungs absorb the oxygen and give back the nitrogen in the breath.

Water is composed of oxygen and hydrogen.

Why may not the stomach have the power of separating these elements (though they *be* chemically united), and of absorbing the oxygen, while the hydrogen is appropriated to some other purpose in the animal economy? And why may not the skin, too, which we know absorbs oxygen from the air—why may not the skin also obtain oxygen from water? If so, this will afford still another reason for the good effects so manifestly derived from frequent bathing and washing.

Another very ordinary effect of cold water is to loosen the bowels.

This latter object, however, is better and more conveniently, as well as more effectually obtained, by the use of cold lavements.

SWEATING PROCESS.

The manner in which profuse perspiration operates upon the body there can now be no difficulty in understanding. First, it operates, like the surgeon's lancet, in reducing the volume of the contained fluids. Secondly, it operates, like the physician's blister, by determining from the centre to the circumference. It thus relieves congestion of the vital organs, and lightens the

whole system. But it does vastly more than can be achieved either by bleeding or blistering. For it extricates from the body an increased amount of carbon and hydrogen, thus producing a *deficiency* of these elements *within it.* This deficiency of carbon and hydrogen is equivalent to a call for more food, in order to supply the place of the lost carbon and hydrogen. And thus it promotes appetite, which is more than can be said for either lancet or blister by their very warmest admirers.

It also promotes *waste,* by increasing the energy of all the *transforming processes,* upon which, we have already seen, health, vigor, and the animal temperature entirely depend.

It also facilitates the combination of morbific matters with oxygen, and furnishes for them a ready means of escape *from* the body, *through* the skin.

But the sweating process, like everything else which is capable of producing *much good,* is also capable of producing *much evil.*

When *used,* it is *useful*—when abused, *hurtful.*

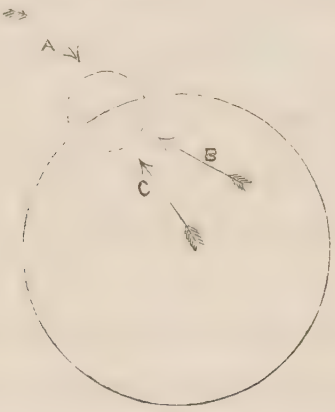
In cold, leuco-phlegmatic habits, where the circulation is sluggish, and the sensibility dull, it is an engine of great power, and productive of great benefit.

But in the sanguine temperament, where the circulation is active, and the sensibility *acute;* or when, in any case, it is carried too far, it is productive of infinite mischief—because, in these latter cases, it increases too much the velocity of the *circulation,* but does *not* increase the rapidity of respiration—thus *destroying the equilibrium* between these two grand and fundamental vital functions—an equilibrium imperatively, absolutely, and unconditionally indispensable to health. And the destruction of which equilibrium, if maintained for some considerable time, must inevitably terminate in death.

The mean frequency of the respirations is 18, and the mean frequency of the pulse 72, in a minute. Four times 18 are 72. Respiration, therefore, is to circulation as one to four—that is, in their relative frequency. I have already shown how, when the respiration is accelerated *without* accelerating the circulation, the increased quantity of oxygen thus introduced produces inflammation of the lungs. I have also explained the fatal effects produced by any cause which converts the vermilion, vital, arterial blood, into black, poisonous and venous blood. I will now show, by diagram, how the acceleration of the circulation,

without accelerating the *respiration simultaneously*, cannot fail to produce this latter baneful effect. Let the larger circle represent the course of the blood, and the smaller one, the lungs. Let arrow

DIAGRAM, NO. VIII.



A represent one inspiration, or one equivalent of oxygen. And let arrows B and C represent eight pulsations or *two* equivalents of black blood forced through the lungs by an accelerated circulation, during the time occupied in taking that one inspiration. Arrow B represents four pulsations, or *one* equivalent of blood; for we have seen that four pulsations are required to carry into the lungs as much blood as can be saturated by one inspiration, that is, one equivalent of oxygen—the velocity of respiration to that of circulation being as one to four. Now, then, the arrow B represents as much blood as can be

saturated by the one equivalent of oxygen represented by arrow A. Arrow B, therefore, absorbs *all the oxygen*, leaving none to combine with arrow C. All that amount of black carbonaceous blood, therefore, which is represented by arrow C passes onward toward the heart, loaded with carbon, to be circulated through the brain, spinal marrow, and other vital parts, to the manifest injury of those parts, whose sensibility it *deadens*, and whose tissues it fails either to *nourish* or to *transform*.

And it is clear that the whole of the vermilion, arterial, vital, and nutritious current becomes, as it were, dirtied in colour, vitiated in quality, and of course unfit for the functions of life.

Nearly twenty years of experience were required to teach Priessnitz this fact, for he has not long begun to perceive it. But that he *does*, at last, perceive it, is proved by the fact, that where he formerly sweated fifty patients, he does not *now* sweat more than half a dozen. With the aid of scientific knowledge, a few hours' reflection would have been sufficient to give him *that information* which, *without* that knowledge, it has taken nearly twenty years of experience to afford him. Experience is a good horse enough, but if

he be not well shod with shoes of science, he will be perpetually *falling lame,* and toppling his rider over his head. Experience can teach a man how to cure any given disease, in the shortest time. But diseases, wholly *unlike* in their nature, and requiring different treatment, are frequently *simulating* each other in their *symptoms.* *Novel* complications and modifications of disease are arising, which give a *new appearance* to an *old disease.* To distinguish between these is of the first importance—and this experience alone cannot teach.

But besides the use of cold water and the sweating blanket, there are *added* to the Græfenberg treatment (and these are indispensable in *chronic* diseases) certain

ADJUNCTS.

The first of these which I shall mention is *exercise* in the open air. But as I have already insisted on the inestimable value of exercise as a remedial agent, and explained its modus operandi by accelerating simultaneously those two grand vital processes, circulation and respiration; and as I shall probably have occasion to refer to it again, I shall not, in this place, dwell further upon it.

Another adjunct to the treatment is perfect and entire abstinence from alcoholic drinks in every form.

The evils arising from the use of alcoholic drinks are now, I believe, pretty generally admitted by all thinking persons. But my province in this work is neither to repeat truisms, nor to make assertions—but to *give reasons*.

Repeated physiological experiments, by Sir Benjamin Brodie and others, have shown that the effect of alcohol taken into the living system is to convert arterial blood into venous blood—that is, to convert the bright, vermilion, nutritious, oxydised blood, into blood which is black in its colour, innutritious in its nature, and literally *poisonous* in its properties. The most positive experiments have proved that *black* blood (venous blood) is directly *hostile to life*—that it cannot be circulated through the heart and brain for more than a few minutes without *inevitably producing death*.

That none of this poisonous black blood, therefore, peculiar to the *veins*, should be allowed to get into the *arteries*, and there mingle with the pure, *vermilion*, nutritious, and *vital* blood, is a matter of the very highest importance. For

while, if it get into the arteries in *large quantities,* it will *kill* out-right; so, in *smaller quantities,* it will produce a degree of mischief proportioned to that quantity. It *deteriorates the quality* of the vital blood. It deadens the sensibility of the heart and brain. It diminishes the vital powers of the digestive organs. It lessens the activity of all the vital transformations. It impairs the memory, and all the mental faculties. It diminishes the strength and all the energies of the body. It adulterates the sources and springs of life. It poisons the very *root* of the tree.

The effects of alcohol on the body are precisely those which are produced by drowning, and by apoplexy—viz. the introduction of black and poisonous *venous* blood into the *arteries* of the brain. The stupefaction into which the drunkard falls is, de facto, neither more nor less than a fit of apoplexy. How does drowning operate on the living body so as to produce death? Its operation is very simple and well understood. The *first* effect of submersion in water is to cut off the supply of air, and therefore of oxygen. The glottis is *spasmodically closed,* and it is a vulgar error to suppose that the water enters the lungs, so long as any degree of vital sensibility remains.

The supply of oxygen being cut off, the black venous blood enters the lungs as usual, for the purpose of being combined with oxygen, and re-converted into scarlet arterial blood. But when it enters the lungs it meets with *no oxygen.* It proceeds, therefore, to the heart, and thence *to the brain,* along the large arteries arising from the arch of the aorta, in its black, unchanged, and unpurified condition, still laden with compounds of carbon. Two or three waves of this black blood, thrown into the brain, are all that is necessary to produce complete insensibility—which, if a little protracted, terminates in death. In death by drowning, therefore, life is poisoned and extinguished by the presence of *venous* blood in the *arteries* of the brain. And, therefore, it is that the only effectual means of resuscitating suspended animation from drowning, is the performance of *artificial respiration.*

In apoplexy the same result is produced. In drowning, the first link in the chain of causes is in the lungs—*the want of oxygen there.* In apoplexy, the first link is in the brain; but the ultimate result, and immediate cause of death, in both cases, is the same—viz. the presence of *venous* blood in the *arteries* of the brain.

But in what manner does alcohol act so as to fill the arteries of the brain with that black blood which is only innoxious when confined to the veins alone?

Alcohol consists chiefly of carbon and hydrogen. The blood of the arteries owes its vermilion colour and vital properties to the presence of oxygen. This we have already seen.

We have also seen that oxygen will enter into combination with carbon wherever it meets with it, and that one of these combinations constitutes *carbonic acid.* We also know that alcohol, once admitted into the body, never quits it again in the *form of alcohol*—which proves that its elements (carbon and hydrogen) have undergone decomposition, and recombination into other forms, *within the body.* Let Liebig explain the rest. "According to all the observations hitherto made, neither the expired air, nor the perspiration, nor the urine, contains any trace of alcohol, after indulgence in spirituous liquors; and there can be no doubt that the elements of alcohol combine with oxygen in the body; that its carbon and hydrogen are given off as carbonic acid and water."

"The oxygen which has accomplished this

change must have been TAKEN FROM THE ARTERIAL BLOOD; for we know of no channel, save the circulation of the blood, by which oxygen can penetrate into the interior of the body."

"Owing to its volatility, and the ease with which its vapour permeates animal membranes and tissues, alcohol can *spread throughout the body in all directions*"—of course, therefore, to the brain."

"If the power of the elements of alcohol to combine with oxygen were not greater than that of the compounds formed by the change of matter, or that of the substance of living tissues, they (the elements of alcohol) could not combine with oxygen in the body."

"It is consequently obvious, that by the use of alcohol a limit must rapidly be put to the change of matter in certain parts of the body. The *oxygen of the arterial blood,* which, in the absence of alcohol, would have combined with the matter of the tissues, or with that formed by the metamorphosis of these tissues, *now combines with the elements.* THE ARTERIAL BLOOD BECOMES VENOUS, (that is, *black*) without the substance of the muscles having taken any share in the transformation."

Now it will be remembered that I have already shown that all physical, that is, muscular, strength depends upon the transformation of the tissues by means of oxygen. But in a drunken man, the oxygen of the arterial blood, which ought to have gone to effect the transformation of the muscular tissue, has been expended, by combining with the carbon and hydrogen of the alcohol. Transformation, therefore, in the muscular tissue has ceased —and in consequence of this they have *lost their strength*—and hence arises (in great measure) the muscular weakness, the tottering, staggering gait of the drunken man.

This is perfectly conclusive—it does not rest on theory—it does not rest on opinion. It is an inevitable conclusion directly resulting from certain facts substantiated by experiment.

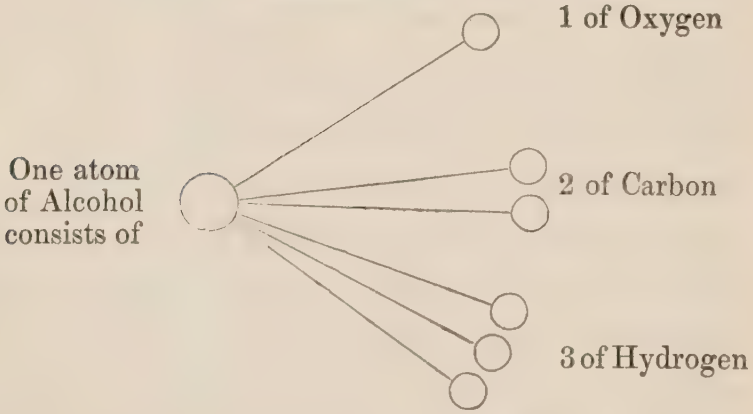
The effect of alcohol, therefore, is to transform the vermilion, nutritious, and vital blood, into the innutritious, black, and poisonous blood, which circulates in the veins, only that it may be expelled from the body; AND TO STOP THE CHANGE OF MATTER.

"It is not less worthy of notice," says Liebig, "that the American Indian, living entirely on flesh, discovered for himself, in tobacco smoke, a

means of retarding *the change of matter* in the tissues of his body, and thereby of making hunger more endurable; and that he cannot withstand the action of brandy, which, acting as an element of respiration, *puts a stop to the change of matter*, by performing the function which properly belongs to the products of the metamorphosed tissues." How many of the poor of England exemplify this truth by resorting to tobacco and gin for the purpose of allaying hunger!

When an atom of alcohol finds its way, by permeation of the tissues, into the arterial blood, its elements are set free, as below:

DIAGRAM, NO. IX.



They are then recombined in a different manner. The *one* atom of oxygen combines with *one* out of the three atoms of its own hydrogen, and forms an atom of water. The other two atoms of hydrogen

rob the arterial blood of two atoms of oxygen in order to form two more atoms of water. While the two atoms of carbon rob the blood of *four more atoms of oxygen,* in order to form two atoms of carbonic acid, which, uniting with the iron, forms a carbonate of the protoxide of iron, as in *venous blood.* Thus the vital arterial blood is, by alcohol, converted into *black and pernicious venous* blood.

The frequent exposure of the skin to the action of the air, at the same time that it is cleansed, and has all its functions invigorated by the water, must also be considered as another adjunct.

When the great *extent* of the skin is considered —its *structure*—its great *sensibility*—its exceeding *vascularity*—and the great abundance of nerves with which it is supplied—it cannot be doubted, I think, that so elaborate a piece of machinery was constructed in order to fulfil some very important functions in animal life. And whatever those functions may be, it must manifestly contribute to the due performance of those functions to keep the skin clean, and to have it frequently *refreshed* by general ablution. And again, whatever its functions may be, it must, I think, materially interfere with them to have the skin constantly *covered* from contact with cold

air, which all experience proves to be so invigorating to the system generally; and to have it perpetually smeared and choked up with the grease of perspiration.

But, independently of this, we know for a certainty, that the office of *respiration*—that "*falling weight*," that "*bent spring which keeps the clock in motion*"—respiration is as certainly performed by the *skin*, as by the *lungs*—and nothing can be more certain than that nature, in her anxiety to ensure the full and perfect accomplishment of the *all-important function of respiration*, has provided us with a double set of respiratory apparatus, viz., the *lungs* and the *skin*—in order that no means should be neglected which could assist in the fulfilment of an office more absolutely essential to life, even than food itself. For if, by accident, an animal be deprived of food, he may still live for several days, and succour may arrive. But if any accident deprive him of air, only for the brief space of a few minutes, he *inevitably dies*.

The most indisputable experiments have shown that the animal breath consists of carbonic acid, the vapour of water, and nitrogen. And the *same* experiments of the *same* experimenters have

as indisputably proved that the exhalation from the body—the *breath of the skin*—is also composed of the very same constituents—carbonic acid—vapour of water, and nitrogen—and that, therefore, *per*spiration and *re*spiration, as the very words themselves would indicate, are *essentially* the same.

But another most important office of the lungs is to import the oxygen into the system. Experiment proves that *this* office is *also* performed by the *skin*.

"From the first moment that the functions of the *lungs* or of the *skin* are interrupted or disturbed," says Liebig, "compounds, *rich in carbon*, appear in the urine, which acquires a *brown colour*."

Here we find that the *same effects* are produced whether the functions of the *lungs* or of the *skin* be disturbed, which clearly shows that the functions of both are the *same*. In either case, the same effects follow—that is, *carbon* appears in the urine—*that* carbon which ought to have been given off either by the lungs or the skin, whichever of those two apparatus happens to be in fault.

Again: "this carbon," (i. e. of the metamor-

phosed tissues) "disappears in the animal body, and the bile likewise disappears in the vital process. Its *carbon and hydrogen are given out through the skin and lungs as carbonic acid and water.*" Again: "physiologists have established *beyond all doubt the fact,* that animals give out *pure nitrogen through the skin* and lungs, in variable quantity."

Thus then the office of the skin, like that of the lungs, is to rid the body of hydrogen, nitrogen, and *carbonic acid.*

But the lungs also import oxygen into the body. So also does the skin. "Over the *whole surface* of the body *oxygen is absorbed,* and combines with all the substances which offer no resistance to it."* Thus, then, it seems that the skin fulfils precisely the same offices as the lungs themselves—viz., that of removing from the body carbon, hydrogen, and nitrogen; and of maintaining the temperature of the body by the importation of oxygen.

Therefore the skin is an *assistant organ of respiration.* But we utterly deprive ourselves of the assistance of the skin by the absurd fashion of our dress, and the ridiculous care with which

* Liebig.

we defend the skin from all access to atmospheric air—thus, to a large extent, shutting *out* the oxygen, so vitally essential to life; and shutting *in* the carbonic acid, which is known to be so *deadly* to all animal existence.

I now come to diet—an important adjunct, I think, not only to this, but to every rational mode of treating disease—but to which no attention is paid at Græfenberg. By diet, I do not mean simply the selecting carefully such kinds of food as are readily digestible—but I mean that kind of dieting which refers to *quantity* as well as quality; and which claims for itself, not only a place among the means for *preventing* disease, but also amongst those adopted for its *cure*.

This treatment, however, is only useful in certain diseases depending upon the presence of morbific matter, either floating in the fluids, or deposited within the cellular tissue.

The principle upon which a rigid system of dieting proceeds is that well-known law, that when only a somewhat deficient quantity of food is supplied to the system—that is, a quantity of food which is not sufficient to yield as much carbon as is required to combine with *all* the oxygen taken in by the lungs and skin to keep up

the animal heat—that the surplus oxygen, under such circumstances, will combine with whatever it can meet with—and that it will combine, *first,* with such matters as are the *least essential to life.*

In the process of starvation, we have already seen, that as soon as the supply of food is first cut off, the oxygen seizes upon the *fat* of the body, which disappears first—that being least essential to life. After the fat, next goes the cellular tissue, muscular fibre, as being less necessary to life than the *brain,* which is consumed *last of all.* "In the wasted bodies of those who have suffered starvation, the muscles are shrunk and unnaturally soft, and have lost their contractility; all those parts of the body which were capable of entering into the state of motion (transformation) have served to *protect* the remainder of the frame from the destructive influence of the atmosphere." That is to say, they have protected the more vital parts by entering into combination with *that* oxygen which otherwise would have combined with and consumed the more vital parts themselves.

Now, then, under the influence of a scanty diet, and upon the principle that oxygen will unite

first with such matters only as are least essential to life, it is clear that if there be in the system any morbid matters, the oxygen will unite first with these, and carry them off through the lungs, skin, and kidneys, in the form of compounds of oxygen. It will unite with the morbific matters *first*, because these are obviously not at all essential to life. These morbific matters can often be detected readily enough in the urine, breath, perspiration, &c.

In this manner a certain quantity of deleterious matter may be got rid of every day. This treatment, however, is only applicable to particular cases.

It is upon the principle here developed that tumors have been known to disappear, and old ulcers to heal, when circumstances have occasionally—as, for instance, in shipwreck—submitted their unhappy possessors to accidental starvation.

I know a gentleman who was entirely cured of an obstinate permanent stricture by adopting a very severe course of abstinence, as it regards both food and drink, for two or three weeks. I am also acquainted with several other very severe cases of disease, entirely cured by the rigorous adoption of a severe diet—but *always in*

conjunction with a very mild course of the water treatment. These cases, however, did not occur at Græfenberg, but at another establishment.

CHAPTER V.

THE CRISIS.

But the most remarkable feature in the treatment by cold water is the production of the crisis. And here it will be necessary to call attention to a few preliminary facts.

A good deal has been said about the resistance, or resisting power, by virtue of which the living system can both *repel and repair* injury.

If one strike the calf of the leg a smart blow with any hard subtance, a slight pain is felt, and a slight redness ensues. But in a few minutes the pain ceases, the redness disappears, and the part is once more in the same condition in which it was previously to the infliction of the blow. If that same blow had been struck on *glass,* the glass would have been broken—on a heap of sand, the sand would have been scattered —on water, its particles would have been separated—on clay, it would have been indented—on stone, it would have been chipped—and on the

hardest wood, some slight alteration of surface would have been produced, although it might be too insignificant to be visible to the naked eye. But whatever the effect produced on any of these substances might be, great or small, they would *continue*. There is no power in any of these substances either to *resist* the effect, or to *repair* the injury.

But the blow on the calf of the leg produced none of these effects. It neither broke it, nor scattered it, nor chipped it. How were these effects prevented? They were prevented by a power inherent in the living system. It does not signify by what name we designate this power—but physiologists call it *vital affinity*.

They call it by this name in order to distinguish it from the power which holds together the integrant particles of *inorganic* matter, which is called *cohesive* affinity—a power whose office it is to preserve to every aggregation of matter its *given form*. It is the vital affinity which resists the chemical action of the external atmosphere, and prevents the body from running into the putrefactive fermentation. For the instant that vital affinity withdraws its resistance—that is, the instant after death—putrefaction commences.

But now let us suppose that a more violent blow has been inflicted on the same part—say by the edge of a cutting instrument. We now observe that a visible effect has been produced. There is now a segregation of parts—in ordinary language, a gaping wound. If such a wound were inflicted on a log of wood, it would remain as long as the log remained. But in the living body we observe, after a few days, that the wound has *disappeared,* and scarcely a trace of it can be seen.

In this instance also, the power which healed the wound is the same power as that which we have just denominated vital affinity; but here it is called by a *different* name in order to mark its different *effects.* The two instances are but different manifestations of *one* and the *same* power—different *modes* in which the *same* power exhibits its influence in producing different *effects,* according to the *different* intentions which it has to accomplish. It is now called the vis medicatrix naturæ—that is, the healing or conservative power of nature. It is also sometimes called vital resistance—and sometimes, and more commonly, vital reaction. And this is the grand resource on which Priessnitz relies. And although he does

not probably know the name of the ship on whose sea-worthy qualities he thus depends for weathering the storm, he may nevertheless manage the helm with as much dexterity as though he did.

But the best term we can employ to designate this principle—one which is equally applicable to all its varied manifestations—is that of the *conservative power*—that power by virtue of which the healthy form and condition of animal bodies is conserved or restored.

Now we are daily, and even momentarily, taking into our systems certain matters, which, although their presence in the body is necessary *for a time,* in order to produce certain effects, yet, having produced these effects, become *then,* if they be not immediately expelled, *foreign* bodies, *extraneous* matters, which have no longer any business in the body, and which, if retained, become sources of inevitable disease. Of these carbon and oxygen are instances. But matters are also engendered *within* the body by the *wrong combination* of elements—combinations which have for issue *wrong,* and therefore *morbid* products. These become, when unduly retained, in the strictest sense of the word, *morbific matters.* Accordingly we observe that nature, for the

express purpose of getting rid of these injurious matters, has instituted certain *outlets* to the body. These outlets are the organs of the excretions—the bowels, the kidneys, the lungs, and skin—that is, regarding only the *expiratory* functions of these two latter organs. If any accident happen to interrupt the functions of these excreting organs—and the functions of two of them, at least, we know are frequently interrupted, viz., the bowels and skin—and especially the *skin*, which, in the upper ranks of life, particularly among females, is almost completely annihilated, from deficiency of exercise—while with the same persons, and on the same account, the respiratory function of the lungs is greatly and unnaturally diminished in activity—the result, I say, of any interruption to the excreting functions is an accumulation of morbid matters within the system, and degradation of quality in all the vital fluids, especially the blood.

But these are only the means by which the conservative power gets rid of morbific matters under *ordinary* circumstances. Under extraordinary circumstances she adopts a different method, and the consideration of *this* method will introduce us, naturally enough, to the *efficacy of the crisis.*

When a minute quantity of the matter of small-pock is introduced, by inoculation, into the system, we know that it is multiplied a thousand-fold, as a small portion of yeast is multiplied in quantity when added to sweet-wort.

Now what are the means which the conservative power adopts in order to throw this morbific matter out of the body? We know, because we see, that it is brought to the surface. Multitudes of little abscesses, called pustules, are formed all over the skin, and from these is discharged the whole of the offending matter. These pustules constitute the *crisis* of the disease, and, when cured, the cure is entirely owing to this *crisis of pustules*—the outlet which these afford to the morbific matter of small-pock.

And all eruptive diseases, as measles, scarlet fever, leprosy, psoriasis, &c. &c., are all only so many efforts of nature to rid the system of certain morbific matters. Sometimes the *unassisted* efforts of the conservative power is sufficient—but sometimes also it is *not so*. Frequently the conservative power requires to be *exalted* by *artificial* means—and this *exaltation* of *the natural powers* constitutes the true foundation of the whole art of curing diseases—and this exaltation of the natural

powers constitutes the sure and *fundamental* principle of the hydrotherapeutic treatment.

In the case of small-pock, the morbific matter is exceedingly attenuated—infinitely divided. It pervades, therefore, the whole system. Consequently, when its crisis arrives, the whole surface of the body is covered with it. But sometimes an isolated portion of morbific matter may become locked up in a single organ. In the case of small-pock the crisis consists of a multitude of small abscesses scattered over the whole body, but when the morbific matter is confined to a *single part*, then the conservative power will open a single abscess for the purpose of expelling it. Thus, when the breast has been amputated, a small portion of the silk used to tie the arteries will sometimes remain after the wound has healed. In this case, after the lapse of some time, the conservative power will institute an abscess in the part, and the silk will be expelled, in company with the matter discharged from the abscess.

But, as I have observed before, the natural powers are not always able to achieve this desirable result *without assistance*. Whenever this is the case, which will happen very frequently in certain constitutions, the morbific matters will

remain in the system, and be a perpetual source of disease—that is, of *unavailing attempts, on the part of the conservative principle, to expel them.* It is clear that, in these cases, what is required at the hands of the physician is some remedy which possesses the power of *exalting this principle—of giving fresh or additional vigor to the natural powers, which only fail in their efforts to throw off the morbific matters—the disturbing cause—from a want of sufficient energy.*

This exaltation of the natural powers is afforded by the hydropathic treatment. And this is the mode in which the crisis is produced—the motive *for* which it is produced—and these are the objects which the crisis *obtains.*

It is a temporary outlet—a temporary excreting organ—instituted by the conservative power for the purpose of ridding the system of certain offending matters—certain disturbing causes—prejudicial to the healthy functions of the body.

But although it is probably true that almost *all* diseases depend upon the presence of morbific matters, of some kind or other, and in the most extensive meaning of the words, yet these matters are not always such as can be expelled by the conservative principle, however energetic. If it

were otherwise, then there would be no such thing as an incurable disease; and the judgment and *physiological* knowledge of the scientific hydropathic practitioner will be displayed in distinguishing, by examination and by the symptoms present, *curable* diseases from such as are *incurable.*

As an instance of the manner in which foreign matter may be locked up in the tissue of our organs, I may mention what sometimes happens when a patient has been taking small doses of nitrate of silver for a considerable time. The whole surface of the skin becomes perfectly and frightfully *blue*—showing a deposition of some compound of silver, or other foreign matters, within the tissue of the skin, to which it imparts its peculiar colour.

It is well known, too, that the bones of young animals fed on madder become *streaked with pink.* These instances fully prove how foreign matters, and causes of disease, may become insinuated, and locked up, in our organs. And out of the hosts of anomalous diseases which are perpetually seeking in vain for relief, and whose causes are utterly unknown, who can tell how many of these have been produced by the lodgement of some

subtle poison—some one or other of the multitudinous drugs or chemicals with which people are for ever drenching themselves—within the delicate and highly sensible tissue of the brain, spinal marrow, or nerves, precisely after the manner in which that matter is lodged in the skin which gives it the blue color, as mentioned above?

At Græfenberg it is quite amusing to observe with what anxiety the crisis is looked for by the patients, and with what joy its arrival is hailed. In most cases, a good crisis is the certain harbinger of a perfect cure. The patients themselves are constant witnesses of this fact, and it is no wonder, therefore, that they should look forward with pleasure and hope to its advent in their own persons. A patient is no sooner missed from his place at the dinner table than the question immediately goes round: "Has so-and-so got a crisis?" And if the reply be in the affirmative, the report spreads like the news of a fresh victory, and his friends assemble around him—not with long faces to condole with him—but with merry smiles, and laughing jests, to congratulate him on his happy fortune.

I cannot refrain here from saying one word concerning what is called the humoral pathology.

It was formerly supposed that *all* diseases depend upon a morbid condition of the humors, or the presence of certain morbid matters in the blood, or other vital fluids. Morbid anatomy, however, has since proved that this is not the fact. A spicula of bone shooting from an ossified artery, and piercing the brain like a nail, and thus producing epilepsy, cannot be called a "morbid humor in the blood."

But, although there are exceptions to the rule, it is now beginning to be admitted by the best medical writers, that there is more truth in the humoral pathology than medical philosophers have been willing to allow. And indeed in many diseases the fact stares us in the face. Thus, in small-pock and cow-pock, ringworm, and such other diseases as can be communicated by inoculation from one person to another, it is impossible to deny that the resulting disease, in the infected parts, has been caused by the introduction of morbid matters or humors into the blood. And this is, obviously, equally true of all such diseases as can be caused by infection or contagion—as syphilis, gonorrhœa, &c., and also of all such as can be produced by inhaling mephitic vapours, as in ague, jungle fever, &c.—excepting

only such as are produced by impressions, made by the inhaled poison, upon the nervous centres. But even in this case, the disease does *not* consist simply in the morbid *impression,* but in the altered state of the fluids *resulting* from this impression.

The phenomena of eruptive fevers are strongly confirmative not only of the doctrines of the humoral pathology, but also of that *other* ancient doctrine, viz. that, in fever, the blood undergoes an actual *fermentation.*

Liebig has lately shown that the process of digestion in the stomach is one of actual fermentation; and that the gastric juice, like the juice of grapes, contains a certain *ferment,* which acts upon the food as yeast upon sweet wort. The product of fermentation, in the one instance, is beer—in the other, it is chyme.

The small-pock matter too which is introduced into the blood by inoculation acts upon the blood as a *ferment;* and as, in ordinary fermentation, the ferment (that is, the yeast) is greatly multiplied in quantity and thrown to the surface of the fermenting mass, so also in small-pock, the *ferment* (that is, the matter introduced into the system by inoculation or otherwise) is *multiplied*

in quantity, and also thrown to the surface of the fermenting mass (the blood) where it escapes through the skin.

Under unfavourable circumstances, too high a temperature for instance, the fermentation of sweet wort, after going on for some time, will run into another kind—a *second* species—of fermentation, viz. the *acetous*. The beer is destroyed, and *vinegar* is the result, instead of beer. So, in small-pock, if the fermentation go on too rapidly, under too high a temperature, the fermentation of the blood is changed in its kind—it then runs on into the putrefactive fermentation—the healthy quality, the normal condition, of the blood is now utterly destroyed—the *beer* has been changed into *vinegar*—and death ensues.

But beer, which has undergone complete fermentation, is incapable of undergoing that *kind* of fermentation—a *second* time. How beautifully do these considerations explain that otherwise unaccountable phenomenon in small-pock and some other diseases, viz. that they can only affect the same individual *once* in his life! No—when once the blood has undergone that species of fermentation, peculiar to small-pock or measles, it has become *incapable* of undergoing it a *second time*.

Since, then, the blood and other humors of the body are capable of undergoing several kinds of fermentation, thus giving rise to new products, the presence of which new products is incompatible with the state of health, there can be no difficulty in conceiving how morbid poisons may be generated in the system, and become the source of disease.

There is one other view to be taken concerning the modus operandi of cold water, to which I will here give very brief expression.

It is a well-known fact that certain kinds of transformations can only take place at certain temperatures. Thus a certain fixed temperature is necessary in order to carry on the vinous fermentation. On this principle, therefore, certain morbid transformations going on in the body may often be put a stop to merely by lowering the temperature. Supposing fever to depend upon a peculiar fermentation of the blood, a doctrine as old as Hippocrates, and still maintained, the beneficial effects of cold bathing in fever is at once explained. It may be said that lowering the temperature of fermenting liquors does not finally stop, but only arrests fermentation, and that when the lowered temperature is

again raised, fermentation will proceed again. But in the animal body it must be remembered that there is, ever on the watch for an opportunity to exert itself, a curative power. And that, by arresting fermentation, *only for a short time,* an opportunity is afforded to this power to exercise its office of removing from the blood the *causes,* whatever they were, of the fermenting process—thus restoring the blood to its healthy condition. Cold water cannot remove the proximate *causes* of any disease, any more than drugs can. Nothing can do this but the powers of the living system. All that it does is to place the body in that condition which is most favourable to the energetic manifestation of the curative power. And this is *avowedly* (as we have seen) all that medicine can do.

CHAPTER VI.

I shall now proceed to enumerate a few of those diseased conditions of the body to which the water cure is most especially adapted. But I would here premise that this mode of treatment, when properly modified, and carefully adapted to the peculiarities of individual constitutions, and to the nature of the disorder, can seldom fail of conferring more or less benefit, let the diseased condition be what it may. This is true from the very nature of the remedy, the effect of which is to *strengthen the general system.* And undoubtedly a certain amount of strength may, by it, be accumulated in the body, although the actual disease itself may not be eradicated. In cases where it is impossible that the disease should be *cured,* the general health and strength may be so much improved, as to render it far more easily *endured.*

I must also premise, that besides those diseases which I am about to mention, as well as many

others concerning which want of room must necessarily keep me silent, there are a multitude of anomalous and undenominated disorders, so infinitely varied in form, character, and symptoms, that any attempt to enumerate them here is perfectly out of question—and yet many of these are unquestionably such as can be entirely removed by hydrotherapeutic treatment, upon the principles herein laid down as the foundation of that mode of cure.

ACUTE DISEASES.

The diseases, over which the water cure is said to possess the most rapid and striking influence, are *acute diseases.* Fevers, febrile diseases, inflammations, &c. &c.—such of them, of course, as are curable by *any* means—are said to be removed with a certainty and rapidity which is little less than magical. A fever which, under ordinary treatment, would confine the patient to his bed for six weeks or two months, is frequently overcome in *two or three days,* and the patient is thus restored to health before there has been time for the approach of that extreme weakness and emaciation so constantly the result of a long illness, even after the disease itself has been vanquished.

In all curable acute diseases, therefore, the water cure is peculiarly and especially available.

NEURALGIC OR PAINFUL DISEASES.

In all painful disorders also—disorders the chief character of which is *severe and acute pain* —this treatment possesses the most extraordinary and even unaccountable powers of relief. Severe pain is a sensation almost entirely *unknown* at Græfenberg.

INDIGESTION.

There is a most extensive class of symptoms, manifesting themselves in various groups, in different persons, attacking almost every individual, more or less severely, and more or less frequently, throughout the whole range of the upper and middle classes; sparing neither age, sex, nor condition; undoubtedly the cause of more human suffering than any other disorder, and which class of symptoms has received the general appellation of indigestion. These distressing sensations are exceedingly various, and indeed only agree among themselves in being universally accompanied by evidences of a disordered stomach. The term indigestion is an

exceedingly absurd one—inasmuch as it implies that the faulty action of the stomach is always the *cause*—whereas the faulty action of the stomach is much more frequently the *effect* of disorder in some other organ. Ignorance of this fact, (well known to medical men, however), has led persons to do themselves infinite mischief, and actually to bring on disorder in a previously healthy stomach, by a misapplication of remedies. For instance, a man gets a headache and a disordered condition of the stomach, at one and the same time. He never hesitates a moment as to what he should do, but forthwith sets about physicing his unfortunate and most innocent stomach—taking it for granted that it is the disordered stomach which has produced the disordered brain ; whereas it much more frequently happens that it is the disordered brain which has produced the disordered stomach. He addresses his remedies to the wrong organ, thus doing no good to the *one,* and infinite mischief to the *other.*

For my own part I here declare my belief that the stomach is an organ much more sinned *against,* than sinning. I believe that indigestion hardly ever (now-a-days) commences in the sto-

mach. But the healthy functions of the stomach are continually disturbed, by a distressed, irritated, fagged, worn-out, condition of the brain and nervous system—from which system alone the stomach, like every other organ, must derive all its vigor. But how can the stomach derive *vigor* from the brain and nervous system, if the brain and nervous system have *no vigor themselves?* Indigestion is almost peculiar to the upper and middle classes, and, amongst these, is nearly a *universal* disease. There must, therefore, be a universal cause for it, which cause must be *peculiar* to these classes. But *excess,* either in eating or drinking, is not *now,* by any means, a *universal fault* in, nor is it peculiar to, these classes.

But there *is* a morbid cause, which *is* almost *peculiar* to the upper and middle classes, and which *is,* also, almost *universal* amongst these classes.

This cause is a morbid, undue, and excessive *excitement* of the *brain and nervous system.* And the morbid sensibility which necessarily results from this constant excess of nervous excitement I take to be by far the most frequent source of indigestion. For it must be remembered that

the stomach derives its digestive powers from the eighth pair of nerves, along which nerves the nervous influence is transmitted to the stomach like electricity along the conducting wire, or steam through a tube. If this nerve be divided in a healthy dog, while digesting his meal, digestion instantly stops and becomes impossible.

Among the upper and wealthy classes, this excessive excitement is derived from artificial, and unnaturally refined, sources of pleasure. The theatre, the ball-room, music, dancing, gaming, political ambition daily disappointed, fashionable emulation perpetually on the strain—petty contentions of all sorts—late hours and luxurious habits—these, in the upper ranks, are the causes of excessive excitement—morbid sensibility—anxiety—indigestion.

In the middle classes the *same* morbid results are obtained, by the *same* means, from sources somewhat different. And the cares of business, the anxieties of speculation, solicitude for the welfare of a numerous family, pride hourly contending with poverty, debts, doubts, dangers, and difficulties—these do for men of the middle rank, what the causes above enumerated do for those of the upper.

Some of the more prominent features of this many-headed monster I will here enumerate. They are nausea, pain about the region of the stomach and sides, head-ache, heart-burn, a sense of fulness, distension, or weight in the stomach, a feeling as if a ball were lodged in the throat, acid or offensive eructations, flatulence, vomiting, especially of a clear liquor, (like pure water) sometimes of an acid quality, and often in large quantity, a sensation of *sinking or fluttering* at the pit of the stomach, and loss of appetite; costiveness or irregularity of the bowels, with a morbid appearance of the evacuations; pain of the back and turbid urine; a disagreeable taste in the mouth, especially on waking; a feeling of stinging, or heat as of cayenne pepper, in the mouth; tooth-ache, palpitation, pulsation in the region of the stomach, irregularity of pulse; short, dry cough, and occasional difficulty of breathing; giddiness, languor, lassitude, depression of spirits, with fear of death or of impending evil.

Now whenever this long train of distressing symptoms has arisen from excessive irritation of the nervous system—from morbid sensibility, without organic lesion—as it does in nineteen cases out of every twenty—it can be cured,

beyond question, by the hydropathic treatment—*by exalting and accelerating the change of matter.*

LEUCORRHŒA, OR FLUOR ALBUS.

This most distressing, enfeebling, and exceedingly common disease—a disease which resists almost every other mode of treatment—depending, as it does, upon chronic inflammation of the uterus, is well calculated to be effectually removed by the invigorating method adopted at Græfenberg, and other hydropathic establishments.

Attempts have lately been made to show that leucorrhœa depends upon an ulcerated condition of the os uteri. It is extremely probable that the os uteri may be frequently found in an ulcerated condition in females labouring under leucorrhœa, but the more probable inference is that the ulceration is the *effect*, and not the cause, of the morbid discharge—whose acrimonious nature is often fully sufficient to account for the ulcerated condition of the os uteri. Besides, supposing the ulcerated condition to be the cause of the discharge, that condition could not have come on without previous inflammation. But, whichever of these two conditions, inflammation or ulceration, be the true cause, the cold water remedy is

equally well adapted to remove it—seeing that *both causes* are themselves *caused* by a *weakened condition* of the organs concerned.

EPILEPTIC FITS.

Whenever this disease depends, as it very frequently does, upon a clot of blood pressing on the brain, it is curable by the hydropathic treatment united to that of a *severe diet*. Besides the cases given in the list of cases in this work, I have been witness to another very remarkable one. The patient was the subject of epilepsy for four years, and the fits recurred regularly every ten days. He has not now had a fit for three months, and is about to return home perfectly cured.

GOUT AND RHEUMATISM.

The cases of rheumatism and gout which have been cured at Græfenberg are almost without number. And when it is considered that these diseases depend upon inflammation of particular structures of the body; and that this inflammation again, in *its* turn, depends upon a *weakened* condition of the nervous system—it is sufficiently easy to account for the fact.

SPINAL IRRITATION.

Spinal irritation, resulting from subacute or chronic inflammation of the vertebral theca, and giving rise to a long train of the most distressing symptoms, is perfectly curable by cold water treatment.

DIFFICULT MENSTRUATION.

Painful, excessive, suppressed, or *insufficient* menstruation, is another distressing affection over which the hydropathic remedy possesses the most absolute control.

INFLUENZA.

Of late years a vast number of persons have suffered greatly from protracted influenza; and occasionally this disease is so obstinate as to resist all ordinary remedies. It yields most readily, however, to the Græfenberg method of cure.

Constipation, hysteria, rheumatic gout, catarrh, rheumatism of the head or of the heart, bilious head-ache, sciatica, lumbago, mercurial diseases, secondary symptoms, inflammation of the kidneys, impotence, neuralgic or painful affections of the nerves—all these are completely under the control of the cold water treatment.

But my limits will not allow me to devote more space to the particular mention of individual diseases. More will be found in the list of cases.

Besides these, however, there is a whole host of anomalous, undenominated diseases, which cannot be referred to any particular class, which come within the scope of the cold water cure. And there is probably *no disease* which cannot be benefitted, more or less, by the exaltation of the living energies, and the improvement of the general health and strength.

In fine, all those diseases depending upon functional weakness—all those depending upon nervous debility, and morbid sensibility—all those depending upon inflammation, acute, subacute, or chronic, *uncomplicated with permanent organic lesion*—all those depending upon morbid matters in the blood or other humors—these constitute that long list of diseases which are peculiarly calculated, from their nature and causes, to be removed by the hydrotherapeutic remedy.

It is not, however, to be inferred that this remedy is unable to cure *any cases* of organic lesion. On the contrary, whenever these cases are, from their nature, capable of cure *at all*, without the aid of surgical operations, the cold

water treatment undoubtedly offers a better and more rational chance of success than any other—as some of the cases herein related *prove*—as, for instances, the cases of fistula, epilepsy, and paralysis.

PART III.

DR. BILLING'S THEORY OF DISEASE.

Having shown that if Liebig's theory of the living actions, (both healthy and morbid) and of the mode in which they are influenced by *cold,* be the true one, cold water *cannot but be* a most powerful remedial agent, I will now also show that if *Dr. Billing's Theory of Disease* be true, cold water cannot but be the *true remedy.*

The FIRST PRINCIPLES OF MEDICINE, by Dr. Billing, is a work too well known, and too universally esteemed, to need any encomium from me. For years no medical work has issued from the press which was received by medical critics and the medical profession at large with such universal approbation as this of Dr. Billing. In every medical library it took its place at once, as a standard work, and remains so to the present

hour. Though essentially theoretical, yet its theories are everywhere so completely supported by multiplied practical facts and illustrations, which its author's position as a senior physician to the London hospital enabled him to accumulate—and the amount of clinical information with which it abounds is so great, the simplicity of its style so felicitous, while the common-sense plainness with which the questions are argued is so strong and convincing, that its hypotheses have almost the force of facts.

It will be observed how beautifully Liebig's theory of life (as far as it regards morbid actions) and Billing's theory of disease, reciprocally support *each other*—and *both*, the principles of the water cure.

Dr. Billing's theory is that "*all*" diseases are caused by impressions made on the nervous centres or their nerves, by which the nervous *influence* (whatever it be) is exhausted or morbidly diminished. That the capillary blood-vessels which (in health) are always held in a state of *semi-contraction* (*tone*) by virtue of this nervous influence, shed upon them by the nerves, become *relaxed and weakened*—(Liebig's diminution of *vital resistance*)—having their *diameters enlarged*,

whenever the exhausted nerves fail in supplying them with the quantity of nervous influence necessary to preserve their tone, or state of *semi-contraction upon their contents.* That the weakened, relaxed, and *enlarged* capillaries now admit a *larger* current of blood, whose motion through them becomes *slower.* That they are, in fact, in a state of congestion. And that altered function or functional disease is the result of this altered condition of the capillaries, and altered size and altered velocity of the stream of blood which they carry. When this congestion takes place in the veins, it constitutes simple congestion—when in the arteries, it is accompanied by *degeneration of the arterial coats*—and now takes the name of *inflammation.* This degeneration of the coats of the inflamed arteries is Liebig's *excessive* action of the destructive force of oxygen—the enlarged arteries *now* containing an *excessive* quantity of oxydised blood, while the *resistance* opposed to its influence is (as we have just seen) *diminished.* This degeneration does *not* take place in the veins, observes Dr. Billing. No—because the veins do *not* contain *oxydised* blood.

Man is almost *entirely composed* of capillary vessels. His body may be compared to a sack

stuffed with hair, every hair being a tube, of a *determinate diameter*, (which particular diameter is necessary to the condition of health) and carrying a stream of fluid, which stream must also be of a determinate size. And this bundle of capillary or hair-like tubes is everywhere permeated by nervous filaments or threads, which shed upon them their electroid influence, whose office it is to *preserve their tone or necessary diameter*—upon the preservation of which their healthy functions depend. When any cause deprives them of a due supply of the electroid or nervous influence, by exhausting the nervous system or any part of it, the healthy diameter is lost, becoming *larger*, and they now admit *too large a current* of fluid, and the velocity of its fluxion is *retarded*, producing congestion.

When any cause, as the exhibition of stimulants, elicits from the nerves too great a quantity of nervous influence, *then also* the healthy diameter is lost, but in a contrary direction. The diameter now becomes *too small*—the vessels *contract* too much—and the size of the current of fluid is now too much diminished. This illustration will, I trust, enable the unprofessional reader clearly to understand Dr. Billing's beautiful theory of disease.

Inflammation, then, consists of weakened, relaxed, enlarged, arterial capillaries, admitting a too large current of blood, whose progress through them is also retarded, giving rise to congestion or engorgement, degeneration of their coats, and *consequent alteration of their secretions.*

"All the business," says Dr. Billing, "of constant support and renewal of parts, and supply of secretions, as the growth or repair of bone, muscle, membrane, and other structures, the formation of bile, saliva, mucous, and other secretions, is carried on by the extreme minute branches of the blood vessels; and whilst these preserve their proper size and tone, all goes on well; when their action is deranged, disease commences, often prefaced by pain, or other disorders of the nerves." "Some capillaries are too small to admit many of the red particles (oxydised blood-globules) unless when they are *enlarged* by inflammation, as in the eye, which, when inflamed, changes from white to red; besides that, even the red capillaries are so minute, that they are not visible individually to the naked eye, till *enlarged* by inflammation." "During health the capillary arteries go on with their work of nutrition and secretion, the muscles are fed, the mucous sur-

faces are lubricated just enough to prevent any sensation from the substances which pass along them, the serous surfaces are made sufficiently moist to slide upon each other without sensation, and the skin is kept soft by an insensible vapour. All this time there is another process going on also, which is the removal of superfluous matter by the absorbents: if it were not for these, there would be inconvenient accumulation of what is deposited by the arteries."

"The deposit or precipitation of solid matter by the arteries is not difficult to be understood; and we can, by reference to *chemical action*, account for the removal also of solids; for solids become fluid or gaseous, by what is called spontaneous decomposition," (Liebig calls it *transformation of tissues* by the chemical action of oxygen) "and thus removable by absorbents."

"The action of the arteries also is *acknowledged* to be contraction, whether considered muscular or not; but there is some difference of opinion as to the degree of action of the arteries in inflamed parts. It is very common to say, that in inflammation there is an increase of arterial action; but a consideration of the phenomena, and of the nature of arterial action, will show that in INFLAMED

PARTS the CAPILLARY ARTERIES ARE WEAKER in their action; that there is DIMINISHED ARTERIAL ACTION, for the action of arteries is *contraction.* Now the arteries in inflamed parts are *evidently larger* than before—less contracted—that is, acting less."

"It is the opinion of some persons even at the present day, that the motion of the blood is accelerated in inflamed parts; though the experiments of Parry and others prove the *contrary* to be the case, as *follows* from the capillary arteries being *enlarged;* inasmuch as where fluid passes through a given space, the current beyond that will be slower in proportion to the wideness of the channel; as in a wide part of a river, where the current becomes slower; and the same may be observed by passing water, mixed with grains of amber, through a glass tube with a bulbous enlargement in the middle; the current will slacken in the bulb, and resume its velocity beyond it."

"The difference between congestion and inflammation is, that in congestion there is merely distension of the vessels; in inflammation there is, in addition, alteration of tissue—actual deterioration, more or less of the structure of the capil-

laries. * * * * The fault commences in the tissue. As soon as a want of that harmony between the nerves and capillaries, which is necessary to organization, takes place, their fine tissue begins to compose," (the action of oxygen becomes, according to Liebig, *greater* than the resistance of the vital force—the same sense expressed in different language) "the particles which were held together by this inscrutable agency begin to be precipitated from one another, &c. &c."

"When accidental mechanical injury, or other cause, changes the action of the capillaries, either by a direct impression on themselves, or by primarily injuring their nerves, *the derangement of their action is the commencement* of disease—secretions become altered, checked, or profuse—nutrition is either diminished so as to produce emaciation, or there is an excessive deposition—vapoury exhalations are diminished to dryness, or increased to fluid—bony matter is deposited in wrong places —or albuminous, fatty, or other particles, so as to constitute tumors—the nerves of parts become morbidly sensible, so as to derange the functions of those parts—portions, on losing their vitality, undergo spontaneous decomposition, (destructive

action of oxygen, either owing to an unwonted quantity of oxydised blood being carried to the part, or from the diminished resistance of the vital force) and are removed by the absorbents."

"Irritation, continued excitation of the nerves of a healthy part, as just shown, at last produces inflammation, by exhausting that nervous influence which gives the capillaries power; they thus become weakened, allow of over-distension, and the part is in the state of inflammation or congestion." "Thus, in a part inflamed, there is diminution of organic action, (contraction) in consequence of which the blood is admitted in excess. As long as the capillaries are supplied with nervous influence, as long as they possess perfect organic action (contraction) they *preserve a due size;* when they lose it, either from the influence not being supplied from the nervous system, or are robbed of it by heat, electricity, cantharides, *or any other cause,* they give way, and admit more blood than before."

Having given this explanation of the nature of inflammation, (which is also maintained by many other very able writers, as Professor Macartney (I think) and several others, and proved by the microscopic observations of German experimen-

talists) he proceeds to show that fever and that class of diseases called neuroses, or nervous disorders, as chorea, hysteria, tetanus, epilepsy, &c.—all those diseases which are characterized by irritation or morbid sensibility—consist in inflammation, that is, a relaxed, enlarged, and congested condition of the capillary arteries of the nerves —in a word, inflammation of the nerves. Indeed, if Dr. Billing be right in his assertion (and I see not how it can possibly be refuted) that *all diseases have exhausted nervous influence* for their cause, then it follows that all diseases whatever must consist essentially in weakened, enlarged, and congested capillaries, since the relaxation of the capillaries must be the first effect which is produced by exhausting that influence which alone preserves to them their normal size or diameter.

Such being the *one* proximate cause or essential nature of *all* disease, the principle of cure is *one* also. Thus there is (properly) but *one* disease, and *one* cure.

The proximate cause is relaxation and enlargement of the capillaries—the indication of cure, therefore, is to *constringe the capillaries*—to cause them to *contract and resume* their healthy dimensions.

Dr. Billing having established this position by a multitude of illustrations and practical facts well known to medical men, together with illustrative cases of particular diseases, as rheumatism, palsy, dropsy, consumption, skin diseases, hysteria, nervous affections, locked jaw, gout, &c. &c., then proceeds to show that all medicines, numerous as they are, together with bleeding, produce their good effects on disease *by* the power, and *in proportion* to the power, which they possess, directly or indirectly, of causing the *relaxed* capillaries to *contract and resume* their healthy dimensions.

He reduces all medicines whatever to no more than *four*—sedatives—tonics—narcotics—stimulants.

Sedatives, direct and indirect, amongst which are included purgatives, emetics, and bleeding, are such as "diminish the action of the heart and other organs by repressing the nervous influence," thus lessening the velocity with which the capillaries are supplied with blood by the injecting force of the heart; and such as, by *emptying* the capillaries, facilitate their contraction by removing or lessening the resistance offered to their contracting sides by the contained blood.

Tonics are such as, being circulated *in* the blood

through the capillaries, have the direct effect of constringing them; or causing them to contract upon their contents, and thus to force or *squeeze* the fluid onwards.

Stimulants are such as elicit from the nerves a temporary, forced, and more than ordinary quantity of nervous influence, causing a corresponding degree of capillary contraction. But the effect of these last remedies is but temporary, since all forced excitement of the nervous centres must ever be followed by a corresponding degree of exhaustion.

Narcotics are such as, by dulling the sensibility of the nervous system, procure sleep, and thus afford an opportunity to the inherent curative power, or vis medicatrix naturæ, to restore the tone, or normal degree of contraction, of the capillaries.

Thus, then, however numerous be the *forms or symptoms* of disease, there is, de facto, but *one disease*. And, however numerous may be the means and appliances of the healing art, there is in fact but *one intention* to be fulfilled—the restoration of the capillaries to their normal dimensions by *constringing their coats*.

I was once asked by a physician, for whose

talents I entertain the highest respect, how I reconciled with this theory *that disease* called worms in the bowels. But to this I replied, that a worm in the bowels, UNTIL IT HAS PRODUCED IRRITATION, is no more a disease than a fly on the hand, or a flea on the back—and when that irritation has been produced, then it is that IRRITATION which constitutes the disease, of which the worm was the REMOTE CAUSE, as a musquito is the remote cause of the inflammation which its bite produces—and we have already seen that irritation (which Dr. Billing with much more propriety calls morbid sensibility) consists in inflammation of the capillaries of the nerves. But no one would think of calling a musquito a *disease!*

It is the *inefficiency* of drugs which has multiplied their number. Two, or two thousand, are required, because there is *not one* which can be depended on. If *one* could be discovered which would always effectually produce the necessary degree of *capillary contraction, then* that *one* would be *sufficient.*

"In some cases of disease," says Dr. Billing, "when the secretions of the skin and kidneys are deficient, we renew them by bleeding, digitalis,

antimony, &c., which lower the force of the pulse, thereby *diminishing the distension of the capillaries*, in conformity with the above statement.

Medicines, such as mercury, iodine, &c., have an effect on the arteries themselves, directly or through their nerves, so as to *make the inflamed capillaries* CONTRACT independently of the consideration of the vis à tergo (state of the heart's action) or quantity of circulating fluid."

"Inflammation is always the *same debility* of capillaries."

"We see that solutions of metallic salts, such as nitrate of silver, tartar emetic, acetate of lead bichloride of mercury, &c. and some acrid vegetables, such as mezereon, &c., act on the capillaries as ASTRINGENTS."

"We know that substances applied to the primæ viæ, or skin, are absorbed and carried into the circulation, and we judge that in this way these metallic salts, oxydes, &c., are carried to the *capillaries* of diseased parts, and *strengthen and cure*."

"All organic action is *contraction*." All organic or animal strength, therefore, depends upon the power of the different parts of the body to *contract*. And, for the same reason, all animal weakness depends upon a loss, more or less, of

the power of *contraction*. And again, for the same reason, all remedies which *strengthen* can only do so by increasing the power of *contraction*.*

"Mercury and iodine remove morbid growths by starving them, which they effect by *contracting the capillaries*."

I therefore consider mercury neither stimulant nor sedative, but tonic; that is, by its specific *action on the capillaries*, whether directly on their tissue, or through the medium of their nerves, it *causes them to contract*."

"When introduced into the system, it (mercury) circulates through the *capillaries*, and gives them tone to *contract*. Liquor arsenicalis, (solution of arsenic) nitrate of silver, the sulphates of copper and iron, mezereon, dulcamara, calchicum, &c., have a similar action. This is also the rationale of the mode of operation of the so-called alteratives, and of what is called stimulating the secretions of the internal organs. When their capillaries are weak, they have their tone restored by mercury, and the secretions are thus renewed; but it should not be forgotten that mercury, like some other tonics, in excess becomes *poisonous*,

* See this same argument enforced under the head of *contractility* in my work on "Life, Health, and Disease."

and may *cause inflammation in other parts,* as it does in the gums, on the principle adduced before, that one degree of contraction of the capillaries is necessary to reduce inflammation, while a still further degree will stop nutrition and bring on wasting and disease."

"And to this influence (constringing the capillaries) I attribute the universal efficacy of antimony as an antiphlogistic remedy, it being doubly valuable in acute cases, from its sedative effects on the heart and pulse, combined with its locally *tonic or astringent effects on the capillaries* of inflamed or congested parts, as well as on those of all the secreting structures.

"I think from the various statements already made, it may be deduced, that the diseases of morbid sensibility, were it proved that they depend upon inflammation" (and Dr. Billing has endeavoured to show that they *do*) "*are not curable by common depletion*: the medullary tissue is too fine to be affected by the force of the circulation, or relieved by taking off the vis à tergo, by bleeding, digitalis, &c.: hence neuralgia, tetanus, hydrophobia, chorea, hysteria, &c. must be reached through the circulation, by what have been called tonics, iron, bark, arsenic, &c."—and

we have seen that these operate only by *constringing the capillaries.*

"Inflammation is that which destroys the life of the part, whereupon the separation of the dead portion takes place:"—this is nothing more than Liebig's theory of the destructive force of oxygen, told in other and more general terms.

But it is not necessary further to multiply quotations from Dr. Billing's first principles. The whole scope and tendency of that work is to prove the position that there is but *one* immediate cause of disease, viz. *weakness,* or exhausted nervous energy—*but one disease,* viz. a *relaxed* and *congested condition of the vital capillaries*—and *but one remedy,* viz. the restoration of the capillaries to their normal or natural dimensions.

It is true Dr. Billing admits of *four* different kinds of remedies, but we have already seen that these are but four different *instruments* for enabling us to produce one grand effect, and this is, in every case, the restoration of the capillaries to their healthy size. Even narcotics, given to procure sleep, would be of but little service, if they did no more than this; for the pain or other disease would return on waking. But they do, indirectly, more than this—for, by procuring sleep, they give

time and opportunity to the inherent powers of the system to restore the capillaries to their healthy standard degree of semi-contraction—in one word, to recover their tone.

Now how does all this bear upon the hydropathic treatment of disease? In what manner does Dr. Billing's theory of disease support, and justify, and recommend that treatment? It bears upon it *immediately,* and in the *strongest* and most *conclusive* manner. According to Dr. Billing's theory the great object is, *in all cases,* to *unload the engorged capillaries,* and to *constringe* their coats. What are the two main features of the hydropathic treatment?—profuse sweating, and the application (partial or general, as circumstances may require) of *cold*—that is, profuse sweating to *unload the capillaries,* and the application of cold to *constringe their coats.* For I suppose it will not be denied by any one, for a moment, that cold possesses this power of constringing the living fibre in a most *remarkable* degree. Both surgery and medicine are perpetually compelled to resort to cold water and even ice for this express purpose, as, for instance, in hæmorrhages, the reduction of strangulated hernia, &c. The efficacy of cold wet cloths,

applied either to the insides of the thighs or to the back, in bleeding from the nose, is sufficiently well known, and even proverbial. That feeling of creeping, chilliness, and even shivering, which is produced by the application of cold, is a very common and well marked proof of the very powerful influence of cold in *constringing the capillary vessels.*

The mode of operation of the hydropathic treatment may be illustrated by what is done in dropsy of the belly. The surgeon first *taps the belly,* and draws off the water. *Then* he applies around it a bandage, in order to support its loose and flaccid sides, and assist it in *recovering its natural dimensions.* This is precisely what the hydropathic treatment does in ordinary diseases—inflammations, fevers, the neuroses, &c. &c.—it *taps the capillaries* (by sweating) and then *supports and constringes their sides,* by the cold bath.

Dr. Billing himself seems fully aware of the value of cold water and cold air, as a remedy. At page 23, after describing inflammation to consist of weakened, relaxed, and congested capillaries, he says: "The way to diminish the inflammation is by increasing the action (contraction) of the arteries, as by *cold,* or astringents, which make

the arteries contract, that is, increase their action."

"When the congestion or inflammation subsides without solution of continuity, it is called *resolution;* and it is very intelligible how *cold,* and astringents, promote this *desirable termination.*" Again: "A still farther proof that they (the capillaries) are in a state of morbid congestion, is the effect of *cold to the loins,* in renewing the secretions; AND THE CONSTRINGING EFFECT OF COLD WATER, or *cool air,* in promoting the secretion of insensible perspiration, and thereby softening the congested skin, in scarlatina."

"By studying the operations of nature* we are led to imitate by analogy. Independently of the regulation of temperature, the usual benefit derived from a *poultice* is that of preventing premature scabbing, by the soft moisture assisting the pus to protect the granulations. The *German water dressing has much the advantage over the poultice.*" And again: "Cold will cause the vessels to shrink." The effect of cold water in

* It was this "*studying the operations of nature*" to which the late Sir A. Cooper was so largely indebted for his extraordinary success in *surgical* practice.

constringing the capillaries, that is, in causing them to shrink, may at any time be witnessed by plunging the hand, when hot, into cold water. When a person has been heated by exercise, the veins on the back of the hand will be observed, in most persons, to be very much enlarged; and in delicate, thin, and weakly persons, they are almost always so towards evening. Whenever these veins are in this condition, if the hand be plunged into cold water, and held there for a short time, they will be found *greatly diminished in size* when the hand is withdrawn.

"But often," says Dr. Billing, "the case is more obstinate, and a torpid, congested, or perhaps we should say sub-acutely inflamed, state of the liver, requires not merely repeated doses of calomel or other mercurials, but leeches and poultices, or *cold wet cloths to the epigastrium*," (region of the stomach). And here, in a note, he observes, "the application of cold is, I think, *not sufficiently often used* in inflammation of the viscera of the chest and abdomen when the surface becomes decidedly hot."

Speaking of consumption, he says: "Some years ago, a gentleman of the name of Stewart adopted a rational mode of treatment, with which

he had considerable success; but, because he could not work miracles, his plan was unjustly depreciated. His method was entirely tonic, and *especially the cautious use of cold and tepid ablutions of the skin*—a modification of cold bathing—a remedy which is found *so universally beneficial in promoting the resolution of strumous* (*scrofulous*) *tumors.*"

"One thing of which I am convinced is, that the true principle of treating *consumption* is to support the patient's strength to the utmost"—and it must be remembered that the grand aim, and principal effect of the water cure, is to *strengthen the system*; thereby giving the inherent curative power the fairest opportunity of doing its *own work.*

Again: "Schwann, (Müller's Handbuch der Physiologie, Coblenz, 1833) by experiment on the mesenteric arteries of small living animals, has demonstrated that I was right *as to the modus operandi of cold* as a remedial agent in inflammation"—viz. that it acts by *constringing the capillaries.*

With regard to the *oneness* of the effect to be produced, in treating diseases, notwithstanding the hosts of different drugs and chemicals with

which our national pharmacopeia groans, Dr. Billing has the following observations: "I have explained how some medicines become useful in such a *variety of diseases* as almost to realize the dreams of the ancients and alchymists respecting a *panakeia,* or an elixir vitæ; and thus why one empirical remedy, antimony, held the reins of the "currus triumphalis" until superseded by the more modern blue pill. I have shown that tonics are not stimulants; and why they may be combined advantageously with sedatives, with stimulants, or with narcotics (the ultimate effect of all being the same); how stimulants are *tonic;* how sedatives are *tonic;* how narcotics are *tonic.* I have shown how every medical man has his hobby *to carry him to the same point,* which, though he thinks it very different from his neighbour's, is as like it as one four-legged jade is to another; how one man thinks he has made a discovery that he can cure cholera with sugar of lead, and that there is nothing equal to it; whilst tartar emetic, calomel, Epsom or Glauber's salts, or common salt, or mustard, or lemonade, or vinegar and water, &c. &c. will do the *same thing;* though none of them more quickly carry off the vomiting and purging than two of these hobbies in double

harness—tartar emetic with some neutral salt, I care little which."

Thus, then, it will be perceived that the reason why we have such a multiplicity of drugs is not because there are a multiplicity of effects to be produced, but because there is *not one* out of all our drugs which can be relied on, at all times, for producing the one effect desired. That one effect is the constringing of the capillaries to their normal diameters, when they have become weakened, enlarged, and congested—and in producing this effect cold water *never fails*.

These last observations of Dr. Billing (and indeed his whole theory) are a complete answer to those who object to the water cure on account of its apparent oneness and simplicity; since he shows that there is but *one* proximate cause of *all diseases*, and that but *one remedy is necessary;* and that the great multitude of drugs has only arisen from the *inefficiency of any one of them*, at all times, to produce the desired effect. According to Dr. Billing, there is scarcely any one drug which would not alone be sufficient to cure almost any disease, provided that one could always be relied on to *empty and constringe the capillaries*. And he clearly states that *different drugs* are only

so many *different means* by which *different practitioners* produce the *same effects*.

Now, then, if it be true that the one great effect to be brought about in the treatment of all diseases be to *unload* and *constringe* the capillaries, how can this be better achieved than by *profuse perspiration* and the cold bath? The hydropathic treatment, which unloads the capillaries by sweating, and constringes them by cold, is clearly an efficient substitute for bleeding, purging, vomiting, uva ursi, digitalis, antimony, mercury, arsenic, nitrate of silver, sulphate of copper, iodine, iron, and multitudes of other remedies, enumerated by Dr. Billing as being beneficial merely by their powers of *unloading and constringing the capillaries*.

"In fact," says Dr. Billing, "experience proves that *cold to the head*, with moderate saline and other sedative medicine, will cure typhus, or prevent the typhous state from occurring in synocha; whereas when wine, with or without opiates, is employed, the *disease frequently proves fatal*. I had one very useful opportunity of seeing the contrast of the different modes of practice during the fever which prevailed in Italy, 1817, the proportionate mortality being very much greater in an hospital,

where the stimulant practice prevailed, than in that under the direction of Dr. Aglietti, in Venice, who (*I suppose out of compliment)* called his manner of practice *the English,* consisting of *contra stimulants*, (sedative evacuants) antimony, salts, purgatives, &c., internally, *with the external application of cold water and free ventilation.*"

Such are the opinions of Dr. Billing with regard to the nature of disease, and with regard also to the modus operandi of all medicines whatever, in curing it, viz., by emptying, constringing, and strengthening the weakened, relaxed, and gorged capillary arteries. And if these opinions be true, the hydropathic treatment is obviously and even glaringly a remedy of almost universal application—if not to cure, at least to relieve—since its two grand features are those of *sweating,* and then of constringing, strengthening, and giving tone to the whole capillary system. And yet, opposed as this treatment is, without consideration, by the great body of medical men, if I were to repeat all the laudations bestowed on Dr. Billing's book, both by the medical press, and private individual practitioners, they would fill a volume.

But it requires very close attention, habits of

reflection, and a perfect freedom from all prejudice, in order to discover how completely *principles* sometimes agree even where the *practice* is exceedingly different. And indeed to illustrate this truth is one of the objects of Dr. Billing's work—to show how the different hobbies of different medical men are all carrying their unconscious masters to *one and the same point*—capillary contraction. And when we recollect that all the functions of life are performed in and by these same capillaries, we ought not to be at all surprised to find that it is upon these that all causes of diseases produce their first impressions, that these are the organs, whose actions first become deranged, and that it is upon these that all remedial agents must be made to operate, in the treatment and cure of all disorders.

Such are the views and opinion of Dr. Billing. And it must be remembered that Dr. Billing is no obscure physician—all theory, and no practice—but that he has been for years, and is still, senior physician to one of the largest hospitals in England, viz., the London—enjoying a field for practical observation and experiment which can fall to the lot of but few.

I will make only one more quotation—its object

is still farther to show that the simplicity and apparent oneness of the hydropathic treatment is no argument against it—disease itself being more simple and more unique than is generally supposed. Thus Dr. Billing cures ague, blue cholera, and influenza, on the *same* principles, and with the *same* remedies, epsom salts, and antimony, and sometimes bleeding. Yet there can scarcely be three diseases more *apparently* dissimilar—and certainly no three diseases can differ more as to severity and the *degree* of danger. "*There is,*" says Dr. Billing, "*but one simple fever, and which is exanthematous, (eruptive) petechial, though the rash may never be sensibly developed, as in scarlatina maligna; and it is continued, synochaus, (synocha, συνεχω), whether with high or low pulse, high or low temperature; and that, when the sensorium is oppressed in addition, it is typhous.*" This whole passage is printed, in Dr. Billing's book, in italics. It is surprising to me how Dr. James Johnson could speak in such high terms of praise concerning Dr. Billing's views of disease, and of the modus operandi of all remedial treatment, and yet that he should write disparagingly concerning hydropathy—since the whole of Dr. Billing's work is, de facto, one long argument *in favour of it.*

Thus I have shown that the principles of hydropathy are in strict harmony with the opinions held, and the doctrines publicly taught, by two of the most celebrated and scientific men (each in his own department) with regard to the nature of life, health, and disease, and the true end and object of all remedial treatment, viz., Liebig and Billing—the two Atridæ of medical science—the Agamemnon and Menelaus—the δυω κοσμητορε λαῶν—of the medical profession.

I will now quit the more particular arguments of science, and endeavour to show that *all general* reasoning—all analogy—all the deductions of experience—also unite to add their testimony to that already given.

With regard to any danger to be apprehended from the hydropathic treatment, it only differs from ordinary practice just *thus much.* In ordinary practice, *even in the most skilful hands,* there is *always more or less of danger,* in the administration of the most common and useful drugs, for all these are *poisons of the most virulent kind,* as mercury, arsenic, prussic acid, opium, oil of vitriol, aquafortis, lunar caustic, iodine, strychnine (nux vomica), copperas, &c. &c., all medicines daily and hourly administered internally, whereas in the

practice of hydropathy there is *never any danger at all*—provided always it be practised by competent persons.

It is evident to the most ordinary understanding that such virulent poisons as those mentioned above, and which are in hourly use, cannot be introduced into the human stomach, even in minute doses, without always doing a certain amount of mischief—and indeed this is admitted on all hands—and that even minute doses may, and often *do*, in delicate habits, or from some peculiar diathesis, produce very powerful and dangerous effects. A case in point occurred, some time since, in one of our hospitals. A woman had been taking mercury—and one day, while sitting up in bed, eating some broth, her head fell suddenly forward, and she died instantly. A post-mortem examination explained the mystery. The atlas—the pivot which supports the head, and on which it turns—had been eaten away by the mercury until it became too weak to support the weight of the head. It snapped while bending forward over her broth, the neck became bent double, and instant death ensued, the inevitable consequence of compression of the spinal cord by the doubling of the neck.

Strychnine, according to Andral, produces *softening of the brain.* A young lady, having paralysis of the lower extremities, after trying many remedies, was recommended by her physician to rub in strychnine. After a time she went to a watering place, and there died. Dr. Pereira, of the London hospital, commenting on this case in his leetures, declared that he had no doubt that this young lady's death was hastened by the strychnine.

In a case of paralysis at the Dreadnought hospital, strychnine was exhibited, at first in doses of one-sixteenth of a grain three times a-day, then one-eighth, then one-fourth, then one-half, all without any *apparent* effect. But one night the surgeon was suddenly called to the man, who was said to be in a fit. It was a *first attack* of tetanus, or cramp. This first attack was almost immediately succeeded by a second, which killed him. There can be no doubt that it was the strychnine which destroyed him.

That hydropathy can kill—and that it may kill —in the hands of the ignorant practitioner—is perfectly true. It would not be worth two straws if it could not. For that which, *when abused,* can do no harm, cannot be capable of much good

when *properly used.* Such a remedy is mere "chip in porridge." But where hydropathy has destroyed a single victim, the practice of medicine has slain its tens of millions—a position so notoriously true that I scarcely think any medical man of character will be found to question it. And the danger to be dreaded from the use of deadly drugs is greatly augmented by the great diversity of opinions which are entertained as to the effects which they produce on the body, frequently causing *one drug* to be given with the view of producing two *opposite effects.*

In a very learned and laborious work published by Dr. Pereira, one of the physicians to the London hospital, and chemical professor at that institution, entitled "Elements of Materia Medica," occur the following passages on the subjects of opium and mercury, two drugs more universally in use than any other two in the whole list. "Several physicians," says Dr. Pereira, "as Dr. John Murray, and Dr. Anthony Tod Thomson, consider opium to be primarily *stimulant;* some, as Drs. Cullen and Barbier, regard it as *sedative*" (that is, just the *contrary* to stimulant); "one, viz. Dr. Mayer, as *both;* that is, a stimulant to the nerves and circulatory

system, but a sedative to the muscles and digestive organs; another, viz. Orfila, regards it as *neither;* while others, as Müller, call it *alterative.*" Now here are five different men holding no fewer than five different opinions with regard to the effects produced on the body by this deadly drug, opium. When these five physicians give opium it is clear that they give it with the view of producing five different and contradictory effects!

But Dr. Pereira proceeds thus with regard to mercury: "Again, mercury is, by several writers, as Drs. Cullen, Young, Chapman, and Eberle, placed in the class of sialogogues; by many, as Drs. A. T. Thomson, Edwards, Vavasseur, Trousseau, and Pidoux, among excitants; by some, as Conradi, Bertele, and Horn, it is considered to be sedative; by one, Dr. Wilson Philip, to be *stimulant* in small doses, and *sedative* in large ones; by some, as Dr. John Murray, it is placed among tonics; by another, viz. Vogt, among the resolventia alterantia; by one, viz. Sundelin, among the liquifacients; by the followers of Broussais, as Begin, among revulsives; by the Italians, as Giaccomini, among contra stimulants, or hyposthenics; by others, as Barbier, among the *incertæ*

sedis"—or those drugs whose modus operandi is not understood.

After reading such a statement as this, one can hardly be surprised that the word physician should have been defined to signify, "a man who puts drugs, of which he knows nothing, into a stomach of which he knows less."

With regard to any danger likely to result from going into the cold bath when covered with perspiration, such danger is perfectly chimerical, and a mere popular fallacy—contrary to all the deductions of science—contrary to all daily and hourly experience ever since the creation of the world—and for which no shadow of a physiological reason can be given; while all physiological reasoning goes directly to prove that it is *safer* to go into cold water when the temperature of the skin has been raised, than when it has not been raised; and that if there be danger at all, it is in going into cold water *without first raising the temperature*—and in this there certainly *is* some danger. And of course it is with the *elevated temperature* that we have to deal in this argument, and not with the mere presence of perspiration on the external surface. For it can certainly be a matter of no importance whether the

skin be covered with a certain quantity of that peculiar grease called perspiration, or whether it be covered with an equal amount of hog's lard or white paint. And it is quite evident, and all modern writers agree that it is so, that re-action (the great object to be attained) will be most certainly produced, and internal visceral congestion (the great evil to be avoided) will be most certainly prevented, by going into the water when the surface of the body is *warm*. And I need hardly observe that the body is not made *hotter* in proportion to the profuseness of the perspiration, but that, on the contrary, it is *cooler* than before that effect is produced, for perspiration is a *cooling* process. So that it will not do to say 'that although it may be good to go into water when the body is *moderately* warm, it is nevertheless bad to do so when it is *extremely* hot.' For when perspiration is present it is *never* extremely hot.

As to the sudden checking of perspiration, this too is a chimerical danger. For the oosing of perspiration always subsides *of itself*, almost at the moment that the means which produced it are withdrawn. And the perspiration which is still visible on the body, is merely that which has been *already produced*, and left upon the skin, by

an action of the vessels which has now already ceased. The perspiration which is now seen upon the body has no more connection with the system than so much oil or other greasy matters.

I say, too, that the supposition of danger is contrary to all daily and hourly experience. For, are not our out-of-door labourers, our wagoners, our sailors, our haymakers, and all our farm servants, constantly exposed, while bathed in perspiration, to the effects of a natural cold shower-bath, in the shape of rain, and that too with perfect impunity? Is it not the constant practice of boys to bathe in rivers, without thinking for a moment, or caring a straw, whether they be in a perspiration or not? Does the North American Indian, when traversing his hunting grounds, and when he finds his path obstructed by a river, ever pause for an instant to consider whether he be in a perspiration or not, before he plunges into the flood? But the Indian is used to it. To be sure he is, and it is to that very use and wont to which he owes his great strength, activity, and unimpregnable health. And why should not Englishmen use and accustom themselves to the same thing? What is to prevent it? Why should it not be? I cannot even *conceive* a reason.

If there were peculiar danger in being caught in a shower while perspiring, every showery day would crowd our hospitals with its victims, and April would be the most deadly month in all the year. Nature has not adapted the inhabitants of the earth to the circumstances of the earth's surface so *bunglingly*. On the contrary, the nature of every living thing has been beneficently *fitted* to the nature of those circumstances among which it was destined to dwell; and had a shower of rain possessed such deadly properties, our heads would have been furnished with a natural umbrella to defend it from the rain, as our eyes are accommodated with natural curtains to defend them from the dust.

In an exceedingly clever pamphlet lately published by Mr. Jackson, entitled "*The Spleen a Permanent Placenta, the Placenta a Temporary Spleen,*" it has been reasoned out with the most beautiful precision and great force, that the spleno-hepatic vein (one of the large veins within the abdomen) is the propelling organ which drives the blood through the portal system of veins and circulates it through the liver; and that it is *congestion in this vein* which is frequently the cause of a great number of diseases (epilepsy, amongst

others). If these views be correct, they will account most satisfactorily for the good effects of cold water, externally applied, in relieving that large class of diseases depending on congestion of blood in the liver—or what is called a sluggish liver. The application of cold to the bowels would necessarily cause the spleno-hepatic vein to *contract upon its contents, and so empty itself,* and propel the blood onwards through the liver, and thus remove all congestion there—just as cold applied to the back of the hand causes the veins there to contract upon *their* contents, thus emptying themselves, and *shrinking* to their proper size. Whatever causes vessels to *contract* augments the velocity of the blood's circulation through them. And congestion of one sort or other, as we have just seen, is the proximate cause of all diseases whatever—and there is nothing which can so quickly and certainly produce this contraction of vessels, and removal of congestion, as the application of cold.

PART IV.

CHAPTER I.

This work has been divided into four parts, each consisting of arguments wholly distinct from those used in the others. The first consists *solely of facts,* in the shape of cases actually cured by the hydropathic treatment.

In the second I have shown how clearly and forcibly that treatment is supported by those scientific views concerning the nature of *life* at present entertained by our most eminent medical philosophers, as Liebig and others.

In the third, I have shown that this treatment is also directly and strongly supported by those simple and lucid views of the nature and causes of *disease* which have been, within the last few years, promulgated by Dr. Billing, as the result of his very unusually large experience, and adopted by the great bulk of the medical profession, as accepted doctrines.

We have now come to the fourth, which might properly be denominated the *rational* part, or chapter of common sense. And here I shall take leave at once of all that particular kind of knowledge usually distinguished as scientific, and proceed as though Liebig and Billing had never written, and as though chemistry, physiology, and pathology were mere idle fictions. We will argue the question now merely as plain men of common sense, trusting to our senses only for information, and only drawing from the facts which reveal themselves around us, such conclusions as are obviously inevitable.

But there can be no rational argument of any kind without one or more undeniable or universally admitted *facts* to serve as a foundation—certain fixed points of support from which the argument must start, and upon which the whole must eventually rest—certain unvarying standards by which the truth or fallacy of the whole must be measured. All those so-called arguments which are destitute of such foundational facts are not *arguments*, but only noisy *disputes*, mere sonorous nothings. In looking about for such undeniable facts in the present instance, the first which strikes us is this: that all animals

(both man and beast) so long as they remain in their primitive condition, enjoy an almost total immunity from disease. There are indeed a few disorders, incident to soil and climate, to which they are liable; but the number of these is so utterly insignificant—the exception to the general rule is so exceedingly minute—that it would not be worth while to take it into account at all, but for the purpose of forestalling any captious objection which might be made against the assertion of *a total immunity*, grounded upon this minute exception. And this fact is equally true as it regards *all animals*—both man and beast. They all enjoy a comparative *immunity from disease*—so long as they are allowed to exist in a *primitive* condition.

The next fact which thrusts itself upon our observation is this: that all animals (both man and beast) which have been removed from their primitive condition to one of high cultivation (as it regards man) and of domestication (as it regards animals—which is, indeed, only a minor degree of cultivation or civilization)—I say that all animals whose primitive habits have been exchanged for the habits of an artificial life—and man in particular—immediately become the prey of numberless diseases from which, in their prim-

itive condition, they are totally free. Our multitudes of drug-venders and medical practitioners, all of whom live, and many of whom make large fortunes, out of the diseases of their fellow men—our hospitals, our dispensaries, our mad-houses—all these, which meet us at every turn, throughout the entire country, together with every man's experience in his own circle, thrust this fact upon our senses, and render it perfectly undeniable. This truth is not so glaring as it regards domestic animals, because they are incapable of arriving at so high a degree of cultivation as man. But with these it is sufficiently evident. For the well fed, warmly clothed, highly groomed, and comfortably stabled horse, is subject to numerous diseases, as coughs, colds, inflammations, &c., &c. from which in his wild state he is wholly free.

Human society, then, in its primitive condition (always supposing food sufficient) is almost wholly exempt from disease.

In its highly artificial condition it teems with disease from one extremity to the other—expending immense sums every year to have its sufferings mitigated—while tens of thousands are, nevertheless, yearly suffering *premature death,* as our bills of mortality demonstrate; and the same thing is true, in a minor degree, of all animals whatever.

Now what is the conclusion which necessarily arises out of these two facts? Why, it is plainly this: that our diseases are the result of our artificial habits. What else *can* cause them? The *difference of habits* is the only difference which exists between man in his primitive, and man in his artificial, state. There is no difference in his essential nature! His structure, his organization, his composition, is the same. There is no difference but the difference of habits, and to this difference can alone be ascribed the difference in the condition of his health and strength. I say it *must* be ascribed to this, because there is no other conceivable circumstances to which it *can* be ascribed.

We look upon the *temperate* man, and we observe that he enjoys health, strength, and vigor of mind. We look upon the *intemperate* man, and we observe that he is bloated and rotten with disease, both of mind and body. And what do we immediately exclaim? To what conclusion do we instantly come? Why, that temperance is essential to health, and that *intemperance* is the cause of disease. We look over the world's surface, and back upon the page of history, and we observe that everywhere man, in his primitive

condition, enjoys a degree of health and strength which is almost perfect. We look over the surface of highly cultivated society, and every where we observe man, in his artificial condition, the *perpetual victim of disease* in some shape or other, and compelled to maintain hundreds of thousands of men whose sole employment is, day by day incessantly, to attempt to alleviate its sufferings. The two cases are exactly parallel—in both cases the premises are perfectly the same. Then why do we not draw the same conclusion? We declare intemperance to be (in the intemperate) the cause of their diseases, because we observe that the temperate man, comparatively with the intemperate, enjoys a much greater share of health and strength, and is liable to a far less number of diseases, and those, too, of less severity, than the intemperate. And since we observe that man, in his primitive condition, enjoys an almost infinitely higher degree of health and vigor than in his artificial condition, and is, indeed, almost entirely free from disease of any kind, how can we help concluding that the artificial condition is the cause of all those diseases from which, in his primitive state, he is totally exempt—a catalogue which embraces at least ninety-nine diseases out of every hundred.

We have thus got two undeniable facts, and one *irresistible* conclusion. Fact the first is, that *primitive* man is always *comparatively* free from disease. Fact the second is, that artificial man is always more or less the victim of numerous diseases from which primitive man is utterly exempt. And the irresistible conclusion is that his artificial condition is the cause of the increased number and severity of his diseases. And these facts and this conclusion are equally applicable to all animals.

The third undeniable fact is this: that there is, within the animal body, some principle or power, which can and does remedy injuries which have been inflicted upon it, as, for instance, in the case of accidental hurts from blows, wounds, &c. It does not matter by what name we designate this principle, but medical men have called it the vis medicatrix naturæ, or curative power. And since one name is as good as another, we will continue to call it by that name still.

The fourth fact, or universally acknowledged truth among medical men is this: that every disease must be cured, in every instance, by the operation of this principle just mentioned, viz., the curative power of the living system.

The fifth undeniable fact is: that effects will always continue so long as the cause which produced them continues to operate—the only possible way of making the effects cease, being to *remove the cause.* The very first thing to be done, in endeavouring to remove effects, is always, without any exception whatever, to remove the cause. But we have already seen that our diseases are the *effects* of our artificial habits, and that our artificial habits are therefore the *cause* of our diseases. The irresistible conclusion therefore is this: that the very *first* thing to be done, as the *first step* towards curing diseases, is to remove the cause which caused them, viz., the *artificial habits,* and bring the patient back as nearly as possible to a primitive condition, and to make him exercise primitive habits, *until he shall have recovered his health.*

But when he has been brought back to the exercise of primitive habits, what is to cure his disease? The repetition of an *undeniable fact,* and an *universally acknowledged truth,* shall answer that question. There is in the animal body a principle, as we have just seen, called the curative power, which can remedy whatever mischief has been inflicted on the system, pro-

vided it be not so severe as to be utterly incurable; AND IT IS UNIVERSALLY ACKNOWLEDGED BY ALL MEDICAL WRITERS THAT ALL DISEASES WHATEVER, IF THEY BE CURED AT ALL, MUST BE CURED BY THIS POWER, AND BY THIS POWER ONLY.

The sixth universally acknowledged truth is this: that "REMEDIES ARE MERELY TO BE EMPLOYED WITH THE VIEW OF PLACING THE BODY UNDER THE MOST FAVOURABLE CIRCUMSTANCES FOR RESISTING DISEASE,"* so that the curative power may have full, fair, and unobstructed play.

But we have just seen that the body is then "*in the most favourable condition for resisting disease,*" when it is in its *primitive* condition! since, in that condition, disease is almost wholly unknown. What then are the inevitable conclusions which arise irresistibly out of these undoubted and indisputable facts? Why, clearly, that the first step towards curing disease is to remove the patients from the influence of the *producing cause,* viz., the influence of artificial habits, since it is a hopeless task to attempt to abolish *effects,* without first abolishing their *cause;*

* Dr. Gregory's Theory and Principles of Medicine.

and, secondly, that when the cause of disease has been thus removed, *under the direction of the physician,* the disease will be cured *under the direction of nature herself*—by virtue of that principle called the curative or restorative power. And this curative process will be accomplished *now,* because *now* the body has been "placed under the most favourable circumstances for resisting disease"—but it could *not* be accomplished *before,* because *before,* the body was *not* "*placed under favourable circumstances for resisting disease,*" inasmuch as the patient continued to be exposed to the operation of those very causes which first produced it.

The question is decided, therefore,—not by me, but by undeniable facts, and universally acknowledged truths—that, in order to enable the curative principle to do its work, and rid the body of disease, it is unconditionally essential that he be brought back, for a time, to a primitive condition, and the exercise of primitive habits—and the only question which *remains to be decided* is, how to construct an *artificial* primitive condition, to the healthful influences of which the patient may be *temporarily* submitted, without overstepping the limits of any of the *fundamental principles* of

cultivated society. Now I maintain that this *artificial* primitive condition is precisely the *very thing* which is furnished by the hydropathic treatment, being more or less *completely* primitive as that treatment is more or less *completely* carried out. For what are those particular influences to which man is exposed in his primitive state, and to which he is *not exposed* in his polished and cultivated state? They are chiefly these. First, simplicity of diet, by which his strength is maintained, and his stomach neither irritated nor fatigued—secondly, total abstinence from all intoxicating drinks, as alcohol, wine, beer, &c., since primitive man drinks nothing but water—thirdly, very scanty clothing or none at all, by which that large and important organ, the skin, is kept constantly exposed to the invigorating, cooling, and healthful influences of the atmospheric air and of the dews of heaven—fourthly, he is perpetually exposed to all the vicissitudes of the weather, wet and dry, hot and cold, without precaution, or any considerable change of shelter or raiment; by which his system becomes hardened and his strength strengthened—fifthly, he lives almost entirely in the open air, and is perpetually in action—sixthly, he rises early and goes early to

rest—seventhly, his nervous system is never unduly stimulated and afterwards enfeebled by any of those exciting scenes of pleasurable amusements, as balls, theatres, &c. &c.—eighthly, his mind is not oppressed by those thousand and one cares and anxieties incidental, more or less, to every class of civilized man.

Now I maintain that the hydrotherapeutic treatment is an exceedingly close imitation of this, the primitive condition of man. It enjoins light and airy clothing, perfect simplicity of diet, total abstinence from all exciting drinks, whether alcoholic or otherwise, enjoining water as the only beverage—it imitates the vicissitudes of the weather and sudden changes of temperature, from wet to dry, from cold to hot, by frequently plunging the body in cold water, after it has been first heated in the sweating blanket—it enjoins constant activity and exposure to the weather—it enjoins early hours, both for rising and retiring to rest—it enjoins total abstinence from all exciting pleasures—and, in short, reduces the patient, for a season, to all the habits of the most primitive state of man—by which his body is hardened and invigorated, and put into that condition which is the most favourable for permitting

it to throw off whatever diseases it may happen to have contracted.

This recurrence, for a season, to primitive habits, is what I have so earnestly insisted upon, several years ago, in my work, entitled "Life, Health, and Disease." While I was writing that book I little thought that there was, at that very moment, a primitive philosopher, in the person of Priessnitz, actually engaged in demonstrating the truth of my views, by reducing my principles to practice, with an amount of success perfectly unparalleled in the history of disease and its treatment.

It is quite curious to observe how exactly the amount of disease is apportioned to the amount of polish and cultivation which characterizes the various classes of men. It is quite curious to observe how disease dogs the heels of man with a louder bark, a fuller and more varied cry, and hotter pursuit, precisely as he recedes to a greater and greater distance from his primitive state.

The class of men who are the least removed from the primitive condition, as it regards habits and cultivation, are the agricultural labourers of remote provincial districts. These, therefore, if my views be correct, ought to enjoy the highest

degree of health. And so they do. This is precisely the fact.

The next class is constituted of those labouring men who, though compelled to live in large towns, are yet allowed to retain so much of the primitive habits as consist in constant exposure to the vicissitudes of the weather, and who live almost constantly out of doors. These are brewer's draymen, postmen, carmen, commercial travellers, market gardeners, wagoners, hackney coachmen, omnibus drivers, paviours, bricklayers, carpenters, &c. &c.—and these, cœteris paribus, next to the agricultural labourers, possess the highest degree of health.

The class next above these is constituted by persons whose habits are so far removed from the primitive as to be almost in all respects diametrically opposed to them. It consists of the "cabin'd, cribbed, confined" factory worker—of weavers, tailors, shoemakers, milliners, journeymen shopkeepers, counting-house clerks, literary drudges, compositors, pin makers, needle pointers, hatters, hat trimmers, straw bonnet makers, lawyer's clerks, &c. &c., a class whose name is legion. And here it is—precisely in this class whose habits are so violently opposed to the

primitive—that disease runs riot with a rampant step, and death holds daily his exulting carnival.

In the several ranks above these, although the habits are different, they are yet widely removed from those of the primeval state, while various causes of unnatural excitement, petty annoyances, intense anxiety, and wearying solicitudes, are superadded—and here also it is that disease is equally rife, although assuming somewhat different forms and characters, as with the class just previously mentioned. It is from these, the middle and upper ranks, that the multitudinous army of medical practitioners and drug vendors derive their livelihood, and are constantly amassing considerable fortunes—the product of the diseases of their fellow-men.

There is one other fact, with the statement of which I shall conclude this chapter. The temperate agricultural labourer, who confessedly enjoys a higher degree of health and strength than is enjoyed by any other class of civilized society, is, from the very nature of his employment, perpetually undergoing the water-cure, from his cradle to his grave. His whole life is one continued practice of the water-cure. He lives in the open air—he feeds on the simplest

diet—he is clothed in the scantiest manner—his very cottage can scarcely exclude the wind—he is constantly liable to be drenched to the skin with rain—he is perpetually exposed to every kind of weather—he rises early and goes early to bed—he is alternately heated with exercise and cooled again by the waters of heaven—he is frequently compelled to wear wet clothes the whole day long—in one word, he is perpetually undergoing the water-cure, and is the healthiest, the hardiest, and the cheerfullest of all the family of civilized mankind. When well fed and not over-worked, his spirits never droop, his appetite never fails—he snaps his fingers at indigestion, and does not know whether he has any *nerves* or not. If ever, from an occasional excess or other cause, he gets ill, a dose of physic and a day's rest—and lo! he is well again. His health is *impregnable*, because he lives constantly in that condition "*which is most favourable for resisting disease.*"

And this is the condition to which invalids must temporarily stoop, if they would recover that health of which a more artificial condition has deprived them.

CHAPTER II.

The natural anxiety of man to be relieved of his complaints—the little or no relief which he can derive, in the majority of cases, from the exhibition of drugs—and the great ignorance which necessarily prevails, throughout the great bulk of mankind, in all that regards the real nature of life, health, and disease—have caused at various times, a vast number of so-called new remedies to find favor with the public. From a few of these some good has resulted. But by far the greater number have proved themselves to be little better than impostures, instituted by design, and encouraged by folly, but vanishing into thin air at the first touch of the hand of science. But I trust I have shown that the hydrotherapeutic method of treating disease is none of these. I trust I have shown that, so far from being empirical, mysterious, and unintelligible, it is strictly founded on those rational and intelligible views which the most scientific men now entertain with

regard to the essential nature of disease, and of the living actions—of the causes of disease, and of the modus operandi of remedial agents, viz. that they all operate merely by placing the body in that condition which is the most favourable to the success of nature's *own* exertions to restore order to the disordered system. But though it is gratifying to be able thus to bring the particular reasonings of science in support of any new art of healing, yet these particular reasonings, as I have just shown, are by no means essential in order to prove, in the present instance, that this *new* art is the *true* art. For *general* reasoning—the deductions drawn from observations made by an unprejudiced exercise of common sense—must inevitably lead us to the same conclusion. For common sense, looking abroad with an unjaundiced eye, becomes immediately aware of this great general truth : that a vast majority of our diseases are exclusively peculiar to a state of advanced civilization and high refinement. It sees that while the buffalo and prairie dog, the wild horse and savage denizen of the eastern jungle, enjoy an almost, if not a total immunity from disease, the stalled ox and stabled horse, the caged tiger and domestic dog, are constantly the subject of

various disorders, and compelled to become customers to the dealers in drugs. It sees that man, too, is in the same condition. In the earlier ages of the world and more primitive condition of society, with the exception of a few, incident to soil and climate, disease was almost unknown to man, and still *remains* so, (with the above-mentioned insignificant exceptions) but *only* with regard to those tribes of mankind who *still remain* in their primitive condition. There is something even ludicrous in the bare idea of a bilious savage, a dyspeptic highlander, or hypochondriac New Zealander—so completely is disease identified with refinement.

Common sense observes, too, that about seventy years is the average age of man in his primitive condition, and when not engaged in war, while it can be proved by figures that one half of *civilized* mankind die before they have accomplished the term of eight years. Pause, and dwell on this fact.

In his primitive state, the disturbing causes—the causes of disease—are chiefly limited to mechanical accidents, and the influences of soil and climate *only*. But in his artificial condition, he is perpetually surrounded, sleeping and waking (for even in his *dreams* they cease not to pursue him)

by a multitudinous crowd of unnatural impressions—morbid causes of his own creation. And thus man, whose characteristic should be wisdom, and whose vanity almost makes him stoop lest his sublime top should strike against the stars, and put out the lights of heaven—throwing away, like an unthinking child, his most precious possession to pursue a butterfly—dropping, like the unreasoning brute in the fable, the substance to pursue the shadow—becomes the fabricator of his own misfortunes—the artificer of his own miseries.

But though our domestic animals are subject to many disorders, still they are *not* subject to *so* many as their masters. The reason is plain enough. The former, it is true, are removed from the natural condition proper to those animals, but they are not so *far removed* as the latter. Teach cats and dogs to think, to read, and to endure the pangs of mortified pride, in their contests with their fellow dogs and cats for rank, wealth, and public estimation, and you will find that you cannot confer upon them these blessings without, at the same time, also conferring on them the blessings of gouty feet and dyspeptic stomachs, with all the concomitant

privileges of a morbid sensibility, irritable tempers, and crazy brains. And he who should succeed in thus lifting these animals out of their natural condition, would also acquire a new privilege—the privilege of building hospitals for sick dogs and crasy cats.

Again, if we subtract from the diseases of the lower orders all those which arise from intemperance or excessive and unwholesome labour, (causes of disease entirely unknown in the primitive condition of man as fishers, hunters, or tillers of the soil) we shall leave them almost wholly free from disease of *any* kind. But if we do the same for the upper and middle ranks, we shall still leave them in possession of a whole host of disorders, arising from moral causes—that is, causes depending upon their habits of life and modes of thought.

Common sense observes all this—it observes that man's diseases are multiplied in number, and increased in severity, in a direct ratio with his advancement in civilization. And it arrives, without any aid from scientific reasoning, at the plain and inevitable conclusion, that human disease is the direct result of the artificial habits of human life. And when common sense has arrived thus far in the argument, and looks around for a

remedy for man's diseases, would it ever occur to him that this could be achieved by cramming his stomach with a quantity of nauseous drugs from which his very nature revolts? Would not the very first thing which suggested itself rather be to *remove the cause?* To withdraw him, for a season, from his pernicious artificial habits which had produced the mischief? To bring him back, as nearly as circumstances will allow, to a more primitive state—to that state which is so favourable to health that disease is almost a stranger to it?—and to retain him in this condition until his shattered system shall have had time to recruit its energies, and to throw off the morbid load which had weighed upon its springs and oppressed their elasticity?

Now this is precisely what hydropathy achieves for its votaries, when carried out to its full extent. It withdraws them from an artificial existence—it removes them from scenes of excitement—it limits the subjects of thought—it conducts them out of the reach of all excesses, whether sensual or intellectual—it leads them out of the heat and the smoke and the morbific atmosphere of the crowded city—it takes them out of hearing of the political hurricane—it relieves them from the

tumultuous cares and anxieties of business, and the turbulent toiling of fashionable pleasures. In a word, it allays the whirlwind of the mind, and allows the brain to sleep.

On the other hand, it brings them back, as nearly as may be, to a primitive mode of existence —it furnishes the mind with new and quieter trains of thought—new, natural, and more healthy impressions are made upon the brain—it supplies them with a simple and nutritious diet, and quenches their thirst with a pure, unexciting, and refreshing drink—it lightens the congested vessels and cleanses the body by sweating—it weans the system from old and morbid cravings, and accustoms it to a new series of habits, and more healthy likings—it strengthens the limbs and circulates the blood by exercise—it refreshes and invigorates the nervous system by frequent exposure to the healthful impressions of the open air—it fortifies and hardens the constitution by repeated alternations of temperature—it removes the morbid sensibility of the skin and allays feverish excitement by frequent washings in cold water—in a word, it gives new force and elasticity to all the springs of life, and enables the body to *throw off* disease by placing it in that position, and surrounding it with those circumstances and

influences which nature, in the loud voice of experience, has pronounced to be the most favourable to human health and strength.

If we look through the living kingdoms of nature, vegetable as well as animal, we shall observe that every living thing has a fixed position in the great scheme of the habitable world—that it has a determinate relation to the other objects with which it is surrounded.* We shall observe that nature has planted it in the centre of a circle of impressions and influences, which impressions and influences are necessary to its healthy existence—we shall observe that it cannot be removed from within this circle—that it cannot be submitted to the action of new and different impressions and influences, without immediate and visible detriment to the integrity of its perfection. We find that the organization of each is fitted and adapted to the impressions with which it is destined to be surrounded—and that the same organization is *not* fitted to endure with impunity impressions and influences of a different kind. Before this can be rendered possible the organization itself must be altered. Thus we find that the organization and nervous system of the

* See "Life, Health, and Disease," *passim*, Burton, Ipswich: Simpkin and Marshall, London.

fish fits it to inhabit the waters—of the bird, to live in the air—and of the mole, to dwell in his burrow. The constitution of the rein-deer fits it to become the healthy inhabitant of the polar regions; while the giraffe droops and dies, if only removed for a few months from the burning, but to him, the necessary influence and healthful impressions of a tropical sun. The dry and stony soil of the rocky mountain gives health and vigor to the towering pine; but the chickweed can only thrive while it forms "the green mantle of the standing pool." If a man possessed a favourite sapling oak, about whose health and welfare he was particularly solicitous, would he cover it with a cloak in order to protect it from the wind? Would he transplant it to his parlour and give it a place by the fire-side? Would he say to himself: "Water is but a cold and a comfortless thing, therefore I will nourish its roots with hot coffee every morning, and brandy and water every night, and a bottle of wine at noon?" The great mischief is that human vanity will not suffer us to perceive the absolute identity of ANIMAL life in man, with the animal life of brutes, and the strong analogy, in all that is essential to physical health, between *human* life and the life of a sapling oak.

But how are we sure that everything has its determined position and relations from which it cannot be removed without injury? We gain that knowledge from the same source from which alone is derived all human and earthly information—from the evidence of our senses. We *know* that it is so because we *see* that is so. We see that while unsophisticated man enjoys an almost perfect freedom from disease, his sophisticated brother is compelled everywhere to build hospitals for the sick, asylums for the mad, and to support whole multitudes of doctors and drug-dealers to heal his disorders, and alleviate his sufferings. The same truth is as applicable to the mechanical contrivances of man as to the organic contrivances of nature. Mechanism and organism are two words of precisely the same import. And it is only by a purely arbitrary decision of custom that we apply the one to the works of nature, and the other to the works of art. We might reverse the use of these words with perfect propriety. And, indeed, we sometimes do—for it is not at all uncommon to speak of the "mechanism of a plant—the mechanism of the human body," &c. —and we might, with equal propriety, speak of the organism or organization of a watch or a

steam-engine—and the "organization of military forces" is a very usual phrase. For an organ is but an instrument, and an organized or organic thing is but something consisting of an aggregation of instruments, arranged in a *definite* order for the purpose of producing *definite* phenomena, when set in motion by a *definite* cause.

What is the essential difference between a steam engine and a horse? It consists merely in the cause of motion. A steam engine is an aggregation of dissimilar parts, instruments, or organs, called wheels, levers, &c., arranged in a definite order for the production of certain phenomena of motion. A horse, in like manner, is an aggregation of dissimilar parts, instruments, or organs, called muscles, bones, nerves, &c., definitely arranged in order to the production of a definite series of motional phenomena. In the steam engine, the cause of motion is the expansibility of steam—in the horse, it is the living principle. If the steam engine be supplied with steam, it not only *will*, but cannot *help*, exhibiting its peculiar phenomena until some of its parts become destroyed by friction, and so its organization impaired. So also in the living animal, when the living motions have been once established

within its organs, its peculiar phenomena must, of necessity, continue to exhibit themselves so long as the vital power—the cause of motion—the *animal steam*—shall continue to be supplied to it. But here, as everywhere else, both with regard to the horse and the steam engine, this universal condition or proviso is attached—viz. that both horse and engine shall be suffered to exhibit each its own phenomena within its own peculiar circle of impressions or influences—that neither horse nor engine be exposed to the operation of disturbing causes—to the influence of impressions not suited to the peculiar organization of each. For if the horse be thrown into the sea, or made to breathe a poisonous atmosphere, or compelled to swallow beef, instead of corn, for food; or wine, or brandy, instead of water, for drink; he will soon cease to exhibit those phenomena peculiar to his organization, either altogether, and so die—or else they will not be exhibited in a proper manner, nor with a proper degree of activity and vigor. And so also with the steam engine—if the conditions proper to its healthy existence be not fulfilled—if its furnace be supplied with stones instead of coals—if its joints and wheels be moistened with water

instead of oil; if the apartment in which it is erected be exhausted of air—in a word, if it be removed from within its own proper circle of impressions and influences, its proper phenomena of motion will cease to be exhibited, or be exhibited imperfectly.

With regard to man, therefore, it is most important to know what are those impressions and influences which are natural and proper to him, and necessary for the perfect and healthy development of all those phenomena which we call life. And fortunately nothing can be more easy than to determine this question. For we have but to compare the health and strength of a thousand farmer's labourers, temperate, well-fed, and not over-worked, with the health and strength of a thousand other men of equal stature taken promiscuously from the shops and counting houses, and mansions of the wealthy, and the question will answer itself.

But what is the practical value of all this, since all mankind cannot be reduced to the condition of farmer's labourers? That is quite true—but my object has been to show, that when any portion of mankind has lost its health, the condition of the farmer's labourer is (essentially) exactly

that to which it *must* reduce itself *for a season,* if he would recover that which it has lost. My object is to show that when an individual has contracted disease, primitive impressions and primitive habits are those to which he must bring himself *for a season,* if he would give to the remedies, used for his restoration, their best and indeed *generally* their *only* chance of effecting their object.

Life is a series of motions. But in order to produce and sustain motion, two things are required. There must be an object to *be* impressed and an *impressing* object. There can be no motion without the concurrence of these two conditions. But in order to produce a sustained motion of a *definite* kind, *another* condition is necessary. There must then be a fixed and *definite* relation between the impressed and impressing object. In order to produce that motion which we call flying, there must obviously be a definite relation between the wings and the element which they impress. A bird cannot fly in water.

In order to produce a definite series of motions, therefore, there must be an impressing object and a recipient of impressions, and a fixed and definite

relation must exist between the impressions and their recipient. A piano forte, a clock, a steam engine, a thermometer, an æolian harp, a grain of wheat, an oak tree, a horse, are so many particular recipients of impressions, and so long as the impressions which they receive are the proper impressions, each will give rise to a series of motions—definite and peculiar to itself. The impressions proper to enable the clock to exhibit its peculiar series of motions, are those communicated to it by the bent spring or falling weight. And while the proper relation exists between these impressions and their recipient, (the clock) the clock cannot fail to exhibit its own proper motional phenomena.

The impressions necessary to enable the grain of wheat to exhibit *its* peculiar series of motions, are those communicated to it by the nutritious juices which it meets with in the soil. These are to the seed what the bent spring or falling weight is to the clock. A grain of wheat is a little clock already put together, but not yet set in motion. Before it can be set a-going, it must be submitted to the influences of the bent spring—the falling weight—that is, it must be immersed in proper soil.

But a grain of wheat is capable of two separate and distinct series of phenomena. And either series can be produced at will only by varying the impressions to which it is submitted. If it be submitted to the influence of a proper soil, that series of motions will result which we call life. If it be submitted to the influence of warm water containing a little yeast, then that *other* series of motions will exhibit themselves, which we call fermentation.

Man, like every other piece of mechanism, (of course I speak only of the *physical* man, since it is with his *physical* health alone that we are here concerned) is a recipient of impressions, destined to give rise to a definite series of motions, in obedience to impressions derived from a definite set of impressing causes—and it can obviously by no means affect the argument whether these impressing causes be such as are called mental or physical. The question is not, whether the impressions be mental or physical, but whether they be proper or improper—natural or unnatural. And this, as we have already seen, can only be determined, by observing whether the impressions are such as enable him to exhibit, perfectly and fully, all those phenomena, which his organization

has destined him to produce, when *properly* impressed—in other words, whether they be such as are best calculated to preserve his health *entire*, and to prolong his life.

Now *are* the impressions to which man, in his highly polished state, is submitted, such as enable his system to fulfil perfectly all its functions? Certainly not—for we see that all polished societies, by which I mean societies *far removed* from the primitive state, are for ever *teeming with disease*. Are the impressions, to which he is subject in his *primitive* condition, such as enable him to fulfil all the functions of the body? Yes. Why? Because in that state we *see* that he is almost totally free from disease of any kind.

Since the physical man, then, like the grain of wheat, or any other organized existence, is but a recipient of impressions; and since, if the organization be perfect, that series of motions which we call life *must* be healthily or unhealthily performed, accordingly as the just and natural relation between himself and the impressing causes is preserved or not, it is easy to perceive the vast importance, when we observe any part of the machine going wrong, of immediately rectifying the error in the nature of the impressing causes—i. e. *habits of life*.

CHAPTER III.

DIET.

With regard to the diet used at Græfenberg, I cannot help offering one or two remarks. The principal animal food there placed upon the table is boiled beef (done to rags) and the veal of calves not more than a day or two old. Hares, coarse, dry, and tough, being *first boiled* and then baked. Baked pork, baked goose, and baked duck, with baked sausages, help to vary the repast. Add to this, old mutton, fœtal calf, and cow beef, *stewed in vinegar*, succeeded by rancid ham served with mashed *gray* peas. While I am writing, I am overlooked by a gentleman, who declares that this statement will not be believed in England. I think *that* is extremely probable. It is nevertheless perfectly true.

Cucumbers cured in nothing but salt and water, which the Germans eat with avidity—saur kraut —hard dumplings—pan-cakes with cheese curds

rolled up in them—puddings made with poppy seeds—these also are the standard and daily delicacies of the Græfenberg table. Add to all this, that the only bread on the table is a composition of barley and rye—add, moreover, that the veal, hare, &c., is constantly either mouldy or putrescent, and that the bread is invariably perfectly sour—and the reader will readily acknowledge that here is an assemblage of savors, flavors, and odors, exceedingly well calculated to give him an indigestion who had never one before. The food is so insufferably bad, that a party of gentlemen, only the other day,* after having stood it as long as they possibly could, were literally compelled to spit it out of their mouths, and retire, in order to buy and cook, as well as they could themselves, sufficient food for their dinner; and they have quitted Græfenberg (that is the Græfenberg table) in order to purchase food for themselves in the town of Friewaldau.

It is lamentable that so important a matter as diet should be so utterly scorned by Priessnitz as it is. And it cannot be doubted that this wretched diet keeps the patients much longer under treat-

* It must be remembered that this work was written at Græfenberg.

ment than would otherwise be required—and that, in many instances, it obstructs the cure altogether. But the numerous and important cures which he is constantly effecting, notwithstanding all this, makes him reckless of diet; and bad food is *cheaper* than good. He does not see, however, that if he gave his patients wholesome food he would cure them in *half* the time—and thus by a more rapid succession of guests he would acquire the same amount of emolument, and add greatly to the character of the wasser kur. But he has more patients than he can possibly attend to, and more money than he knows what to do with. Success has made him careless.

But I have seen (not at Græfenberg) the most astonishing effects produced by a judicious union of the water cure with a rigorous diet—the effect of which is to excite what is called *compulsory absorption.* The principle on which compulsory absorption is founded is that well-known law of nature that when the supply of food is *diminished,* the absorbents are *compelled* to make up the deficiency by seizing upon all such matters as are useless in the living economy. In this way, morbid matters which are present in the system

are taken up, and finally carried out of the body by the excreting organs.

I have seen patients submitted to this treatment with the most satisfactory results; and in every instance, as soon as the system begins to feel the influence of this treatment, the urine becomes excessively turbid, the breath foul, and the perspiration offensive, indicating the presence of morbific matters, which are in this way making their exit out of the body. In a short time, however, these excretions resume their natural appearance and odor, and the patient gets completely well. And I have seen epilepsy of four years' standing, ulcers of the leg of thirteen years' standing, and old enlargements of the ankle and knee joints cured by these means in a surprisingly short time.

QUALITY OF WATER.

With regard to the quality of water, rain water or river water, *filtered*, is as good as spring water —and, than some kinds of spring water, certainly much better. The water for bathing only requires to be *cold and clean*.

AUTHENTICITY OF REPORTS REGARDING THE CURES PERFORMED AT GRÆFENBERG.

There certainly are cases when incredulity becomes as great and sure a sign of weakness as too much credulity. The case of the Græfenberg cures is one of these.

When a man is reporting his own case, treated by himself alone, if he have the *will* he has certainly the opportunity of deceiving the public. But Priessnitz may be said literally to perform his work in *public,* so numerous are his patients, and so frequent and general is the intercourse between them. Even those from different countries, and speaking different languages, are generally able to associate and converse together by means of the French tongue. In their walks, in their lounges about the town of Friewaldau, in the billiard room, at the ball, at the springs, at the douche, at the dinner table, they are all frequently meeting, and inquiring into the progress of each other. Amongst all but the English, they make no secret whatever of their diseases, let them be what they may. But they converse about them with the utmost freedom, and exhibit their sores, and tumors, and cutaneous

diseases to all comers and to all inquirers, without the slightest scruple. This honest unscrupulousness has its advantages. In the first place it is highly advantageous to those who, like myself, go to Græfenberg for the purpose of studying the effects of the water cure. And in the next place it makes every man's case so thoroughly known to all the town, that it is impossible that any deception should be practised as to whether this or that particular case gets well or does not get well. The cases which get well, and those which do not get well, are equally known to the whole establishment. The patients, too, who are, while I now write, assembled at Græfenberg and Friewaldau, are from almost all countries. There are Italians, Frenchmen, Swedes, Russians, Englishmen, Irishmen, Scotchmen, and one Armenian. Besides these there are Poles, Moldavians, Transylvanians, Hungarians, Hamburghers, Hanoverians, Bohemians, and Prussians—and the whole of them are men who have left their several countries, and various avocations, for the express purpose of submitting themselves to the water cure. And it is surely sufficiently clear that if the great majority of these persons did not get well—if they found that they had been entrapped,

by false representations, into taking a long, tedious, and expensive journey of many hundreds of miles to no purpose—I say it is surely sufficiently obvious that they would, long ere this, have published to the world their disappointment, and exposed the cheat. But instead of this, the great benefit they themselves receive is constantly inducing them to write home for their sick relations to lose no time in joining them at Græfenberg. An English gentleman is at this moment on his way from Græfenberg to England for the express purpose of bringing back with him his whole family, who are sickly, in order to submit them to the water cure. Another Englishman has just written home for five female relations, labouring under various complaints, to join him early in the spring.

The number of patients is far too great, and they live too much together, and in too close a communication with each other, for the continued practice of anything like deception, or the successful carrying on of any cheat. I was at Græfenberg during the whole of the winter, and all that time, notwithstanding the snow was generally a foot deep, the roads impassable for anything but sledges, and the bath

rooms constantly festooned with icicles, there were upwards of two hundred persons, men, women, and children—all persons of great respectability, and many of them of high rank—then undergoing the water cure. On the first of January, according to the printed government return, for the Austrian government takes a monthly account of all Priessnitz' patients, there were two hundred and thirty-four patients then under treatment. And during the last year (1842) one thousand five hundred and two persons underwent the cure at Priessnitz' establishment, many of whom are now living in England.

Under circumstances such as these it is manifestly impossible that any false representation should long remain uncontradicted. No man in his senses would dare to propagate a false statement which could be so easily, and from so many quarters, instantly disproved.

Again, it must be remembered, that the water cure is not a nine-days' wonder—a mere thing of yesterday—it has now stood the test of *twenty years' experience*. It did not, however, as all popular bubbles invariably do, leap into celebrity at one bound—and then burst. But it has gone on gradually and steadily *forcing itself* upon

attention and respect, by its own sole intrinsic value, and in the very teeth of a strong popular prejudice against it—I say it has gone on thus for twenty years—from the time when the annual number of Priessnitz' patients did not amount to fifty, up to the present time, when they exceed fifteen hundred. Some ten years ago, too, Priessnitz' was the only establishment in existence. Now, however, all Germany is becoming dotted with them—Prussia, Austria, Russia, and Belgium, all have their water establishments. They are rapidly multiplying in France (whose government, like that of Austria, sent an official medical officer to the Græfenberg establishment to inquire into its merits); and, at the eleventh hour, England is beginning to follow the example of her continental neighbours.

In the teeth of such evidence as this, both ocular, auricular, and circumstantial, to affect to rank the treatment of disease by the Græfenberg method amongst the ordinary bubbles of charlatanry, is to exhibit an unreasoning incredulity as little creditable as the grossest credulity.

For myself, I can only say that I went to Græfenberg unbiassed and unprejudiced, for the sole purpose of examining the treatment with my

own eyes, and of ascertaining its true value by the evidence of my own senses. During the whole of the winter I have had the most abundant opportunities of witnessing its effects in all sorts of diseases. I have studied it with the closest attention; I have tried the effects of all the various modes of applying the remedy on my own person; and I have adopted the practice on the fullest conviction, and in the most sincere belief that it is a remedial agent of extraordinary power, and capable of curing a greater number of diseased conditions than can be cured by drugs. It possesses, too, this great advantage over the administration of drugs—where it *fails* to cure, it not only does (in judicious hands) no harm, but *always some good.* Whereas it is an *acknowledged principle* in the practice of medicine, that *every dose* of drugs does a certain amount of harm to the system—that every dose is a *little evil*—a small injury voluntarily incurred in the hope of removing a *greater.* But there is an old adage which teaches us that "ten littles make a mickle;" and another which declares, that the "continual dropping of water will wear away stones;" and undoubtedly the continual dropping of doses of physic into the human stomach will

not fail in time to wear away the health and strength of the most hardy constitution.

That man was not designed to be a physic-taking being is, I think, sufficiently clear. The human senses—their very use and office—are to induce him to *take* that which is good for him, and to *avoid* that which is hurtful. And *taste and smell,* more especially, were given for this express purpose. And from this consideration alone, the revolting nature of almost all drugs, both as it regards their taste and smell, furnishes a strong argument *against* their use, and a *strong proof* of their *pernicious* qualities.

TONE, TONIC, TONICITY, &c.

What is meant by the tone, tonicity, or semi-contractile state (which is the *healthy state*) of the capillaries, may be illustrated by a piece of india rubber tube. Suppose a piece of india rubber tube two inches long, and having a bore or calibre half an inch in diameter. Grasp this in the hand until its bore or calibre is reduced to only a *quarter of an inch.* The tube, in this condition,

is in a state of tone, tonicity, or semi-contraction, which tone it owes to the nervous energy of the hand which grasps it.

In health the capillaries are in this same state of tone or semi-contraction, which tone *they* owe to the nervous energy shed upon them by the nerves.

Now, if a blow on the back of the hand suddenly deprives it of strength—if the nervous energy of the hand be thus suddenly exhausted—the fingers relax, and the india rubber tube is necessarily *relaxed also* (by virtue of its elasticity), and its *bore is increased from a quarter to half an inch again.* It has now lost its tone, tonicity, or semi-contractile state, and whatever fluid be flowing through it, the *size* of the stream will clearly and necessarily be *doubled.* The stream will be *half* an inch thick instead of a *quarter* of an inch. And if the india rubber tube were very long, and its sides excessively thin and delicate, like the capillaries—and if, like the capillaries, it were very large at the end into which the stream was propelled, and gradually tapered away, getting smaller and smaller, while the propelling power at the larger end continued in full force, then it is clear that the narrower *parts* of the tube would be

put violently on the stretch, by the lateral pressure of the fluid, and would be made to carry (if they did not burst) a much larger stream, because their delicate sides, deprived of their resisting or contractile power, would no longer have strength to resist the *distending effects* of the stream as it rushed into and through them. And if some parts of the tubing were weaker and more delicate than other parts, then it is quite clear that these parts would become *more distended* and gorged with the fluid than the other parts; and in these gorged portions of the tube the fluid would move on *more slowly*.

When the piece of tube, grasped in the hand, has been *relaxed,* by depriving the hand of its power to grasp it with sufficient firmness to keep it in a state of semi-contraction, what is the remedy for this condition of the tube? To restore the weakened energy, the contractile power, of the hand, so as to enable it to grasp it again with the necessary degree of tightness. So, in the relaxed and weakened capillaries, the remedy is to restore their *contractile power,* and thus enable them to recover their healthy degree of semi-contraction.

A piece of india rubber tube whose bore *was*

half an inch, but which is grasped in the hand until its bore is only a *quarter* of an inch, represents a *magnified* capillary in a state of *health* or tone. When a blow has partially paralysed the hand which grasped it, so that the pressure of the fingers is no longer able to *contract the tube sufficiently*, and so that the bore of the tube becomes greater than a quarter of an inch, then that relaxed and enlarged tube represents a relaxed and enlarged capillary—and the function of that capillary will be disordered until it has been *constringed again* to its natural size, or *due degree of semi-contraction.*

While superintending the progress of these sheets through the press, I became aware of certain tables showing the comparative ratio of mortality among the different European countries.

They were first published in the Edinburgh Philosophical Journal, and are quoted in the Dublin Literary Journal. They seem to have been drawn up with great care and accuracy, and from the most unquestionable data. They are

intended to show "*the proportion of deaths to the population, and of the annual mortality among each million of inhabitants in the principal states of Europe.*"—*Dublin Literary Journal.*

"According to these tables there annually die —1 inhabitant in 28 in the Roman state and the ancient Venetian provinces; 1 in 30 in Italy in general, Greece, and Turkey; 1 in 39 in the Netherlands, France, and Prussia; 1 in 40 in Switzerland, the Austrian empire, Portugal, and Spain; 1 in 44 in European Russia and Poland; 1 in 45 in Germany, Denmark, and Sweden; 1 in 48 in Norway; 1 in 53 in Iceland; 1 in 58 in England; 1 *in* 59 *in Scotland and Ireland.* It thus appears that the smallest chances of life and its shortest duration, are NOT, as one might believe, among the effects of the rigorous climate of Norway, or the marshy soil of Ireland; it is in the beautiful climate of Italy that life is reduced to its *minimum extent.*

"On the contrary, it is among the icy rocks of Iceland, and in the midst of the *eternal fogs* of Scotland, *where man attains his greatest age.*"—*Dublin Literary Journal.*

These facts are pregnant with much matter for reflection; and most fully bear out my long-

adopted position that the warm and cozy comforts with which we surround ourselves are deeply injurious to life and health. And that those *discomforts,* or, as we are fond to consider them, *hardships,* which we so sedulously avoid, are amongst the *preordained influences which are absolutely essential to health and longevity.*

These tables show that Ireland and Scotland are the two countries in which man enjoys the highest health, and attains the greatest age. Yet look at the condition of the Irish people! scantily fed on milk and potatoes, half naked, living in mud huts of the most miserable description, exposed to all the influences and vicissitudes of wind and weather—yet these are the people who enjoy the highest health, strength, and spirits, and attain the greatest age!

I was not aware of these facts until within the last few days—yet, six years ago, in my "Life, Health, and Disease," reasoning solely from man's position on the earth, and the nature of animal life, I strenuously contended that the *comforts* of civilized society—their dread of exposure to wind and weather—the warm flannels and other clothing in which they envelope themselves—the sedentary life they lead—the

care with which they defend themselves from the rain; and the pains they take to exclude the breath of heaven from their houses; and the warm carpets, curtains, beds, and fires, with which those houses are furnished—in a word, *the undue degree in which they administer to sensual enjoyment*—for "*comfort*" is but another word for sensual enjoyment—are amongst the most prolific sources of that torrent of disease, and diseased appetites, which pours its deadly current through all the divisions of society.

He who would enjoy *hardy* health must live HARDILY.

I beg of the reader to pause, and dwell upon the facts disclosed by these tables, and to draw his own inferences.

HYDROPATHIC LACONICS.

1.

At all times and seasons hydropathy may be practised with the most *certain advantage;* but Autumn, Winter, and Spring are the best seasons for carrying out the treatment most effectively.

2.

It is *general disorder* which first produces *local disease*—and it is therefore the restoration of the *general health* which must constitute the first step towards the removal of *local disease.*

3.

In treating chronic diseases, the effect of the hydropathic method is an exaltation of the general health and strength.

4.

"Many persons of great experience practise well empirically (this is Priessnitz' case) without much brains or reasoning; but he who begins

upon principle, and then profits by experience, must become a much more skilful practitioner." —*Billing's First Principles of Medicine.*

5.

"The cure of all diseases must be effected by the *powers of the living system.* Remedies are merely to be employed with the view of placing the body under the most favourable circumstances for resisting disease."—*Dr. G. Gregory's Theory and Practice of Medicine.*

6.

Pregnancy is no obstacle to the hydropathic treatment; on the contrary, by improving the health and strength, a modified employment of this treatment facilitates parturition, diminishes the severity and danger of labor, and prevents any great degree of subsequent weakness, and diseases consequent upon that weakness. Mrs. Priessnitz, a small delicate woman, invariably practises it both immediately before and immediately after confinement, and occasionally during the whole term of gestation.

7.

"In how few cases of indigestion is the stomach itself first diseased, though dyspepsia is a most convenient word, and the poor stomach is blamed

for faults not its own!"—*Dr. Billing's First Principles of Medicine.* The fault consists in debility of the nervous system.

8.

In some forms of disease enough of the hydropathic remedy may be carried out at the patient's own house—but in those cases which require the *full treatment*, with all its various adjuncts, it can only be carried out safely and *successfully* in the vicinity of a hydropathic establishment, where the patient is constantly under the eye of the practitioner.

9.

There can be no danger in going into a cold bath while perspiring—first, because it has been practised by Priessnitz, on thousands of patients, for twenty years, and no single instance of mischief has been ever observed to arise from it. Secondly, it has been the habitual custom of the Russians since time immemorial, and no danger has been observed to attend it. Thirdly, the lower classes of society are constantly exposed to be drenched to the skin, almost daily, during the rainy months, while they are covered with perspiration, arising from their several out-of-doors employment, and no evil has been observed to accrue

from it; on the contrary, *they suffer less from disease* than the classes above them.

10.

"The physician, carrying his knowledge into the streets and highways of life, has laboured assiduously *(the lancet in one hand and quinine in the other)* to arrest decay when hurrying forward with a too fatal precipitancy."—*Dr. Gregory.*

"The lancet in one hand," says Dr. Gregory, "and quinine in the other"—these being the two great engines of relief in acute and chronic diseases—the lancet to *lower the pulse* in acute diseases, and quinine to *strengthen the system* in chronic. Both these effects are produced by the right application of the hydropathic treatment. The *continued* application of cold in acute diseases, as by the cold bath or wet blanket or sheet, for *several hours, will lessen and lower the pulse even to a thread.* While the *occasional* use of the bath, accompanied by exercise, exposure to the air, simple diet, early hours, and all the other adjuncts of the treatment, will strengthen and harden the system to a degree infinitely beyond that which can be obtained by any other means whatever. Thus it supplies the place of the two grand engines of the old practice—viz. quinine and the lancet.

11.

Physical man is an impressible mass of matter destined to perform certain actions (both internal and external) in obedience to the impressions made upon him by certain impressing causes. When the impressing causes are right, the impressions will be right, and the actions performed in obedience to those impressions, right also. This is health. When the impressing causes are wrong, the impressions will be wrong, and the actions resulting from those impressions, wrong also. This is disease.

To substitute right *impressing causes* for wrong ones, therefore, is to substitute *right impressions* for wrong ones, and this is to substitute right actions for wrong ones—and this is to remove the causes of disease.

When wrong impressing causes have been removed, and right ones substituted, there is within the living body a restorative or curative principle, which will remove the wrong impressions made by the wrong impressing causes. To remove wrong impressing causes, therefore, and to substitute right ones, is to cure disease. But disease can never be cured while the wrong impressing causes which produced it are suffered to continue to operate.

12.

A satisfactory explanation of the essential nature or proximate cause of a *common cold* has never been given. Liebig's theory of a mutual and equal resistance between the vital force and destructive force of oxygen explains it clearly. What are the symptoms of an ordinary cold? Defluxion from the nose—sore throat—hoarseness—cough—sneezing—and a sense of soreness over the whole surface of the body. What are the parts affected by these symptoms? The schneiderian membrane lining the nose—the parts of the throat near the root of the tongue—the air passages leading to the lungs—and the skin. Why are these parts, in especial, first affected, when a man has taken cold, in preference to others? Because these are the parts of the body with which the oxygen of the air must necessarily come in contact before it can possibly enter the body so as to reach the internal organs. It happens thus: a continued stream of cold air, or continued exposure to wet, *while the body is inactive*—or excessive fatigue, or any other *debilitating cause*—first lowers the tone and diminishes the resistance of the vital force throughout the whole body, thus giving a preponderance to the

action of oxygen over the resistance offered by the vital force. And as the oxygen must first come in contact with the skin, nostrils, throat, and air passages leading to the lungs, before it can reach the internal organs, (these being the inlets by which alone it can gain admission within the citadel) these are, therefore, precisely the parts on which, if Liebig's theory be true, its destructive agency *ought* first to be exerted; and these *are* the parts on which it *is* first exerted—and inflammation of these parts *ought* to be the first manifestation of an undue intensity in the action of oxygen; and inflammation of these parts *is* the first manifestation of that undue intensity.

If the effect of the debilitating causes in lessening the resistance of the vital force have not been very great, then the vis medicatrix naturæ, or restorative principle, will restore the equilibrium between the resisting energy of the vital force and the destructive influence of oxygen, and thus remedy the mischief, in a few days. But if the vital force have been greatly depressed, then the destructive agency of oxygen will be further manifested in the more internal organs, and fever, rheumatism, or inflammation of some deep-seated

organ will be the consequence, before the restorative principle has had time to perform its task of restoring the equilibrium. Nothing can more clearly illustrate Liebig's theory of disease than the phenomena of a common cold.

13.

Nothing can be more self-evidently true than that the word artificial is only another term for unnatural, since everything which is not artificial must necessarily be natural, and everything which is not natural must necessarily be artificial. There is no mean power between art and nature. Whatever does not result from the one must result from the other. It is allowed on all hands that the life of every highly cultivated society is highly *artificial.* It is therefore *unnatural.* But can that which is *unnatural* be possibly *proper?* Can Art be considered a better judge of that which is fittest for man's welfare than nature? And is not the word nature, when thus used, obviously only another term for God himself? All the contrivances of art are the result of *human ingenuity.* The contrivances of nature are the result of *divine wisdom.*

Those several contrivances which we call comforts, and with which, in our polished condition,

we surround ourselves, are the inventions and adaptations of *human ingenuity,* by which we administer, in an *undue degree, to sensual enjoyment.* What wonder that they entail upon us disease and premature death? The influence of the weather, and all those various circumstances and impressions to which man is exposed in his primitive condition, are the institutions and adaptations of divine wisdom. What wonder that we should find them necessary to our health and well-being? What wonder that we should find it impossible to get rid of our diseases while we obstinately persevere in preferring the ordinances and contrivances of art to the manifest ordinances and contrivances of God himself?

But are we not to exercise and use the ingenuity wherewith God has endowed us? certainly —to *use,* but not to *abuse* it. But how do we know that we are abusing God's gift of ingenuity or reason when we surround ourselves with all those appliances of pleasurable sensation which we call *comforts,* but which we *ought* to call luxurious indulgences? I answer: by the punishment of diseases and premature death, of which the evidence of our senses gives us daily proof. We know that they are wrong by the evil conse-

quences which follow them. How do we know that intemperance is wrong? By the evil consequences which follow it. How do we know that poisons are injurious to health? By the evil consequences which are observed to follow them. How do we know that it is wrong to indulge in the use of alcohol? By the evil consequences which follow its use. How then do we know that the domestic habits of a highly-cultivated people are injurious? As in the former instances, by the evil consequences which are observed to follow them—by the multitudinous diseases and premature deaths which are everywhere observed to be inseparable from a highly-cultivated condition of society, from which diseases and from which premature deaths a *primitive* condition of society is comparatively free.* Are there no other unwholesome and unnatural stimulants to the nervous system besides those of alcohol, wine, and beer? Thousands and tens of thousands. All kinds of artificial stimulants do not elicit those peculiar phenomena called intoxication, but all operate injuriously upon the health—they all first excite, and finally exhaust, the nervous system. They

* One half of civilized mankind die before the age of eight years.

all entail upon us the RETRIBUTIVE PLAGUE of numberless diseases and premature death. It is the punishment which God has awarded to the presuming pride of art, or the *abuse* of human reason. God did not create man for the purpose of getting money, nor of surrounding himself with all those multiform appliances of so-called comfort which *none but the rich can purchase;* and to prove that he did not, he has determined that none *shall* purchase them without purchasing disease and decrepitude along with them.

14.

Hydropathy does but assert the supremacy of God.

15.

Hydropathy, when taken with all its adjuncts, is an *artificial primitive condition* to which the sick man *temporarily* submits himself for a temporary purpose, viz., that of giving nature, assisted by art, a fair opportunity of healing his diseases.

16.

But water, when used by the hydropathic physician as a remedy for disease, is a NATURAL INFLUENCE INTENSIFIED BY ART.

17.

Total abstinence from every species of stimulating beverage is absolutely necessary to the success of the treatment.

18.

Drinking large quantities of water, without some specific object, (as, for instance, relaxing the bowels,) is productive of no intelligible good, and proves injurious by distending the stomach, and over-stimulating the kidneys.

19.

Every person in England who is cured of his disease by the hydropathic treatment, owes a large debt of gratitude to Captain Claridge, whose indefatigable exertions and indomitable courage, in spite of all opposition, have succeeded in planting hydropathy in this country—a soil in which, protected by humanity, and watered and pruned by science, it cannot fail to thrive, and grow, and flourish—a blessing to the people.

20.

Of Dr. Billing's work, Dr. James Johnson, in his Medico-chirurgical Review, thus speaks: "We know of no book which contains, within the same space, so much valuable information; the result, *not of fanciful theory, nor of idle hypothesis, but of*

close, persevering, clinical observation, accompanied with much soundness of judgment and extraordinary clinical tact."

BURTON, PRINTER, IPSWICH.

WORKS BY SAME AUTHOR.

1.

NUCES PHILOSOPHICÆ;

OR, THE

Philosophy of Things

AS DEVELOPED FROM

THE STUDY OF THE PHILOSOPHY OF WORDS.

In order to bring Mr. Johnson's Nuces Philosophicæ within the reach of a more numerous class of readers, the Publisher has reduced the price from 12s. 6d. to 7s. 6d.; it is now one of the cheapest books of the day, consisting of nearly 600 octavo pages, handsomely printed, neatly and strongly bound in cloth.

"Perhaps a larger mass of information, philological research, and sound practical sense, was never comprised in six hundred handsome pages."—*Argus.*

"After being wearied by the superficial character of our modern literature, we can imagine nothing more delightful to the genuine student than meeting with such a work as this. The author discusses in the most logical manner various subjects connected with moral philosophy. Not only are his arguments exceedingly rich in illustration, but the knowledge they contain is so felicitously expressed that it must illumine the most obtuse intellects, and entertain those who have the least inclination for instruction."—*New Monthly.*

"Mr. Johnson has completely succeeded in sweeping what is ordinarily called metaphysics, with all its mystical trumpery, from the list of human sciences. * * His etymology of the word *think*, and his account of the *operation of thinking*, is exceedingly beautiful, clear, and simple, and we should conceive, cannot leave a doubt upon the mind of any intelligent reader. * * After this need we say to all lovers of truth and common sense, read the book?"—*Church of England Quarterly Review.*

"A hundred such men placed about our world, and adequately encouraged, and where would all the *Messrs. Humbug*, that large and flourishing firm, dwell, and how would they carry on business?"—*East Anglian.*

"A valuable addition to the intellectual philosophy of our country."—*Atheneum.*

"The more we have read of Mr. Johnson's Philosophy of Things, the more we are convinced that nothing equal to it, in deep thought and laborious research, has appeared in the English language, since the days of Locke and Horne Tooke."—*Johnson's Medico-Chirurgical Review.*

London: Simpkin, Marshall, & Co. Ipswich: Burton.

2.

SIXTH THOUSAND,

Enlarged and improved by the Author, rendering it the Standard Edition, 12mo, cloth, 5s.,

LIFE, HEALTH, AND DISEASE;

In Letters to Brother John.

"This is such a book as Cobbett would have written had he possessed medical knowledge."—*Spectator.*

"He who attends to the advice given in this book wants no more, and he who neglects it would find no benefit in a whole Encyclopedia of Medical Science."—*Gent.'s Mag.*

"To the healthy we recommend this work, that they may know how to preserve that which they *enjoy*—to the *unhealthy*, that they may learn how to recover that which they have *lost.* The rules are *few*, but they are GOLDEN ONES."—*Metropolitan Magazine.*

"All who would avoid disease, doctors, and drugs, should read this instructive and interesting work."

3.

Second thousand, One Shilling,

THE WATER CURE:

A LECTURE

ON THE

PRINCIPLES OF HYDROPATHY,

DELIVERED BEFORE THE

COUNCIL OF THE HYDROPATHIC SOCIETY,

BY

Edward Johnson, M. D., author of "Life, Health, & Disease,"

ON HIS RETURN FROM GRÆFENBERG.

The above Lecture is a compendium of the present volume, and is well suited for general distribution.

Important Testimony of Father Mathew.

"Dr. Johnson's admirable lecture on the Principles of Hydropathy is calculated to be A POWERFUL ASSISTANT TO THE SACRED CAUSE OF TOTAL ABSTINENCE, and as such is eminently entitled to my highest approbation."—*Theobald Mathew.*

4.

In Octavo, price Sixpence,

REPLY

TO

DR. JAMES JOHNSON'S STRICTURES

ON

HYDROPATHY.

London: Simpkin and Marshall. Ipswich: Burton.

BURTON, PRINTER, IPSWICH.

BOUND BY
WESTLEYS &
CLARK.
LONDON.